Aspects of the Phonology and Verb Morphology of three Yemeni Dialects

by

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Abstract

This thesis challenges a number of widely held assumptions concerning dialectology. Generative approaches to dialectology have assumed that related dialects share identical underlying representations and that dialect variation results from different rules or different ordering of the same rules. In the introduction, it is demonstrated that this position is untenable. Firstly, it is claimed that there can be no such notion as an objective dialect and that the term 'dialect' is most sensibly used to describe what native speakers perceive to be their language variety; and secondly, it is argued that different dialects may have independent underlying representations. In this light, the task of the dialectologist is seen to be examination of the different levels of the grammar in which dialect variation may and does take place.

In terms of this overall perspective, the thesis adopts a model of underspecification first proposed by Pulleyblank (1986) and Archangeli (1984). While certain aspects of the phonology are viewed as language universal, this model does permit and exploit language specific variation, and thereby proves particularly apt for an approach to dialectology which rejects positing a single underlying representation for cognate forms in related dialects.

These general principles are applied to a study of three mutually intelligible dialects spoken in the western mountain range of North Yemen: Hubaiʃi, Gabiini and Kusmi. Aspects of phonology and verb morphology are investigated and it is seen how dialect variation is manifested in different components of the grammar. Chapter one establishes the set of syllable types and examines syllabification processes. Chapter two determines the identity of vocalic features and the vocalic matrix: to this end, the minimal vowel is established for the dialects. In chapter three, consonantal features are considered and the identity of the minimal consonant is determined. Chapter four looks at the sound triliteral verb in terms of voice and inflection. Chapter five considers the possibility of two minimal segments within a single prosodic system and establishes the identity of the minimal consonant at the lexical level. Chapters six, seven and eight investigate dialect variation in the lexical component by considering: feminine verbal and nominal inflections; non-sound triliteral verbs; and [+R] spread (the spread of lip rounding) as it affects vowels of the perfective verbal stem. In the Appendix, note is made of utterance-final phenomena.

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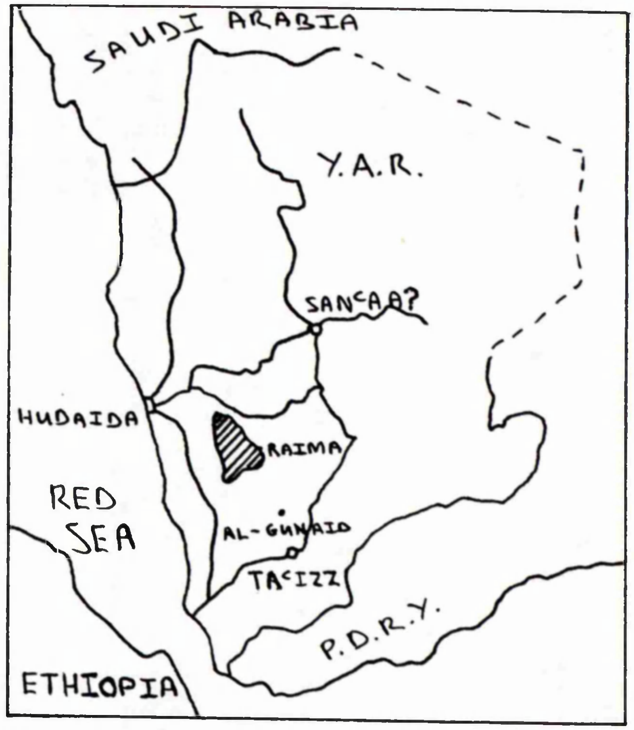
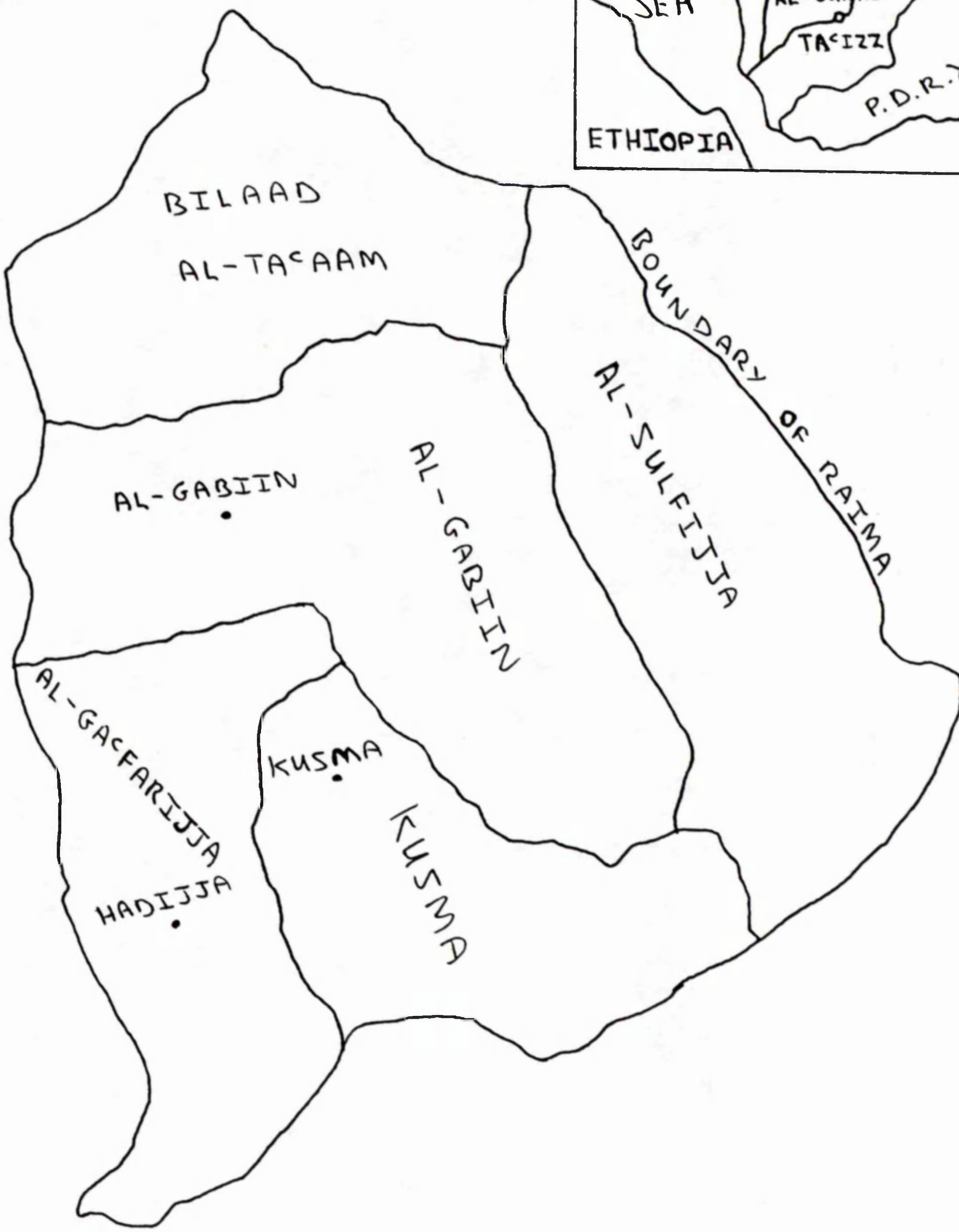
SKETCH MAP SHOWING THE LOCATION OF AL-GABIIN, KUSMA AND AL-GUNAID (HUBAIS)





Introduction

'al-lugha wilidi fi l-maʃraq - ei ma?rib -
atrabba fi ttihaama wa taHassana fi San^{c}aa? wa miriDhi wa
taga^{c}ga^{c}a fi ʃarahab xalf ta^{c}izz' Shaikh A.[1]

'kull(i) bilaad u-lahaa ʃi? xabar' (Goitein 1937:233)[2]

0.1. Field Methodology:

North Yemen is situated in the south western corner of the Arabian penninsula, lying south of Saudi Arabia and north and west of South Yemen. The country hugs the Red Sea and is bordered to the east by the deserts of the Empty Quarter. From West to East the country is divided physically into the coastal range of the Tihaama, the foothills, the mountain range and a central plateau which rises up to 12,000 feet. It was the relative isolation of the Yemen Arab Republic, its geographical and ethnic diversity and its dialect diversity which had already been alluded to in previous works that first attracted me to this country. I travelled out to Yemen in November 1985 to conduct fieldwork principally in the western mountain range and stayed until January 1987.

0.1.1. Area of interest: 'k-dialects'

All three dialects in examined in this thesis are members of the 'k-dialect' group. This group was so defined by Diem (1972,1973) and Behnstedt (1985,1987) because, as Rossi says, the dialects in this group:

1. 'Language was born in the East - Marib -, developed in the Tihaama, improved in San^{c}aa? and fell ill and grew old in Sherehab behind Ta^{c}izz'
2. 'Every village (lit. country) has its own way of speech'

'desinenze in -k nelle I und II Persona del Perfetto'
(Rossi 1937:240)

He continues to provide the following attested forms:

'I suffissi -k^{wu} ≈ -k^{wo} ≈ -ku ≈ -k per la I persona singolare, -ka ≈ -k (-či = č per il femminile) per la II persona singolare. -ku ≈ -kun (-kan femminile) per la II persona plurale del Perfetto. (Rossi 1937:261)

Thus in Hubaiʃi, one of the dialects examined in this thesis, one finds:

k a t u b [k]	'I wrote'		
k a t a b [k]	'you m.s. wrote'	k a t a b [k u m]	'you m.pl. wrote'
k a t a b [k i]	'you f.s. wrote'	k a t a b [k ɑ n]	'you f.pl. wrote'

And this compares to what is found in the majority of Arabic dialects and to Classical and Modern Standard Arabic where the perfect aspect for the first and second persons takes t, as in the Modern Standard Arabic:

k a t a b [t u]	'I wrote'		
k a t a b [t a]	'you m.s. wrote'	k a t a b [t u m]	'you m.pl. wrote'
k a t a b [t i]	'you f.s. wrote'	k a t a b [t u n n a]	'you f.pl. wrote'

It was the mention of these types of dialects by Diem (1972,1973), Jastrow (1980), Rossi (1937, 1938), Maltzan (1873), Sharaf al-Dīn (1970), Goitein (1960) and Blau (1983) together with the mention that dialects in Yemen maintain 'Himyaritic traces' (Landberg 1908-1913) that ignited my interest in this particular area. Diem and Jastrow stressed the importance of investigating these dialects before they disappear as a natural result of 'nivillierung' due to foreign influence, improvements in communications, education and the stigmatisation of what is considered to be 'outdated'. In 1955 Cantineau laments that very little is known about Yemeni dialects spoken outside San^{C}aa? (Cantineau 1955:151), and by 1986 the situation had hardly changed in this respect.

0.1.1.1. The 'k-perfect' as one of a number of 'Himyaritic traces':

It appears to be fairly well established that the k form is more archaic than the t form attested in other modern Arabic dialects. Diem states that dialects which use the k form can be considered of the most original Yemeni if not new Arabic dialects (Diem 1973:75). Not only is it presumed that k was the perfect aspect ending of first and second persons in Sabeo-Himyaritic, but also, k was attested in Assyrian, Hebrew and is presently found in dialects of South Arabian languages - Mehri, Soqotri and ʃHeri (Brockelmann 1908, Thomas 1937) and in Ethiopic languages (Brockelmann 1908, Lambdin 1978, Dillmann 1907). Brockelmann says:

> 'Die Grundform ku ist im Ge^{C}ez erhalten; es ist dasselbe Element, das im Ass. (anākū) und ursprünglich auch im Hebr. (jetzt ?ānōchī) zur Verstarkung der Pron. I Person dient. Diese Grundform ist noch im Tigre kū (kō) und Tna erhalten, im Südabessin aber spirantisch geworden: amhar.: hū, har. gur.: xū.' (Brockelmann 1908:572)

And Dillmann states for Ethiopic grammar (Ge^{C}ez):

> 'For the first person the sign in the Singular is ኩ, in the Plural ነ. The k in ku, it would appear is more original than the t, which all the other Semitic tongues exhibit.' (Dillmann 1907:203)

If these dialects do contain aspects of Sabeo-Himyaritic, then the 'k-perfect' ending may prove to be only one factor among a wealth of further factors. Kampffmeyer claims:

> 'wenn wir immer umfassendere Materiale der arabischen Dialekte gewinnen werden, können wir wohl daseits von den viel betretenen Wegen mehr oder minder starke Reste alter südarabische Sprache antreffen.' (Kampffmeyer 1900:623)

And Glaser, though he does not mention the 'k-perfect' ending, and so we do not know whether he consciously includes the 'k-perfect' ending in 'das alte Idiom', observes:

> 'In der Sprache der Gabail findet man heute noch Anklänge an das alte Idiom des glücklichen Arabiens; ich habe eine Reihe solcher Wörter verzeichnet, und ihre Stammeseinrichtungen und Gebräuche erinnern vielfach an das alte Sabäertum.' (Glaser 1855:201)

And certainly, other pertinent and related morphological and phonological phenomena had been noted by Maltzan, Goitein and others:

i. The use of <u>-es</u> in some areas of the south west mountain range for the third feminine singular object pronoun and possessive determiner (Maltzan 1873:245). This form is no longer recorded by modern dialectologists;

ii. The use of ʃ for the third feminine singular subject pronoun in al-Gades:

> n a k k a ᶜ [ʃ] e h 'she has pulled out her eye'
>
> (for * n a k k a ᶜ a t h a a) (Goitein 1960:16/366)

iii. The use of <u>dhii</u> as the relative pronoun in some dialects (cf. Landberg 1908, Diem 1973, Behnstedt 1985) including Hubaiʃi which is otherwise attested only in old South Arabian (cf. Kampffmeyer 1900:627).[1]

1. Wright mentions that some Arabs, especially of the Tayyi? tribe, use <u>dhu</u> as the relative pronoun (Wright 1971:272).

iv. The 'k-future' prefix for first person singular (kasiir - 'I will go' in Gabiini and Kusmi) (and cf. Rossi 1938, Diem 1973);

v. The use of a feminine first person singular independent pronoun ?anii 'I' beside a masculine pronoun ?anaa (Goitein 1960:20/370, Diem 1973, Behnstedt 1985).

vi. The phenomenon of 'kaʃkaʃa' where the /ik/ or the /ki/ of the second feminine singular object pronoun and possessive determiner is rendered [ʃ]. It was noted by Sibawaihi (II: 282) that many people from the Tamiim and Asad tribes pronounced the second feminine singular object pronoun as [ʃ]. 'Kaʃkaʃa' is also mentioned in Tāj al-^{c}arūs and Lisān al-^{c}arab as a feature of the speech of the Tamiim, the Asad, the Rabii^{c}a and the MuDaar. In Yemen, 'kaʃkaʃa' is a linguistic feature of speakers in most of the Central Plateau and the western mountain range. In and around San^{c}aa? the second feminine singular object pronoun and possessive determiner is pronounced as [ʃ] (Rossi 1939:38,41, Jastrow 1984). In 'k-dialect' areas, it is frequently the case that not only the object pronoun and possessive determiner, but also the subject pronoun is pronounced as [ʃ]. This is the case in Gabiini, one of the dialects examined in this thesis, i.e.:

a.	^{c}a l e e [ʃ]	'on you f.s.'
	b e e t [i ʃ]	'your f.s. house'
b.	? a n t i s i r [ʃ]	'you f.s. went'
	? a n t i k a t a b [ʃ]	'you f.s. wrote'

and this contrasts with the Classical Arabic forms:

a.	^{c}a l a i [k i]	'on you f.s.'
	b a i t (u) [k i]	'your f.s. house'
b.	? a n t i s i r [t i]	'you f.s. went'
	? a n t i k a t a b [t i]	'you f.s. wrote'

And for the language of al-Gades, Goitein notes that:

'The pronominal suffix <u>ik</u> (second feminine singular) normally is pronounced [eʃ] . . . . . There are, however, some people of al-gades who use ʃ for <u>k</u> in the verbal suffixes as well.' (Goitein 1960:366)

vii. Of particular phonological interest is the nasalisation of long high vowels in utterance-final position, and the glottalisation of final non-fricative consonants in words which receive ultimate or penultimate stress (Rossi 1939, Diem 1973, Jastrow and Fischer 1980, Jastrow 1984, Behnstedt 1985,1987). In Hubaiʃi, this latter phenomenon leads to the formation of at least one ejective consonant - [k'], viz:

/m a l i k/ 'king' ---> m a l i [k']] ꝏ

0.1.1.2. Documented evidence of the 'k-perfect':

The first European record I have come across in which the existence of the 'k-perfect' ending is acknowledged in dialects of Yemeni Arabic goes back to Maltzan 1873, where he states:

'In der Stadt Raima bei Zabid, bei den Yafi^{c}i, Hauschebi, Çobehi, ferner bei den Qomeschi und <u>D</u>iebi werden noch die altsüdarabischen (sabäisch-äthiopischen) Verbalsuffixe gebraucht. Man conjugiert das Verbum <u>kan</u> (er war) folgendermassen: <u>kunk</u> (du warst) <u>kunku</u> (sie waren) <u>kunan</u> (wir waren).' (Maltzan 1873:245)

Arabic sources go back further; Landberg speaking of Himyaritic traces in dialects of central Yemen (Ibb, Gibla) cites a passage from <u>Tārīkh San^{c}ā?</u> by ar-Rāzi d.1068:

رايك بنحلم كولدك إبنا من طيب

I saw in a dream that (?) I bore a son by a good-natured man.

(cited in Rossi 1937:261)

Kampffmeyer notes aspects of old South Arabic in living Arabic texts. In Syria towards the end of the first century A.H. a number of troops were sent from South Arabia to Syria. It appears that they maintained their speech patterns to a large degree. He notes a recorded song dating back to A.H. 72/73 in Syria:

يا ابن الزبير طال ما عصيكا	Oh, Ibn Zubair, how long have you disobeyed.
وطال ما عنّيتنا إليكا	And how long have you made us suffer.
لتحزننّ بالذى أتيكا	Now you be sad over what happened to you.

(Kampffmeyer 1900:622)

In spite of documented evidence for the contemporary use of the 'k-perfect' in Yemeni dialects, Thomas (1937) and Brockelmann (1908) seem unaware of the use of such forms in Modern Arabic dialects. Thomas, discussing the existence of k to denote first and second persons in the perfect aspect of the verb in South Arabian languages, states:

> 'It is attested directly in Mahri and Soqotri and in Ethiopian languages. It existed, according to Arab records, in ancient South Arabian; but the inscriptions tell us nothing on this point, being recorded only in the third person.' (Thomas 1937:105)

0.1.1.3. The location of 'k-dialect' speakers:

In 1937, Rossi began to map the geographical location of k-dialects in a way more easily accessible to European scholars. He characterised the area in which k-dialect speakers were found as the 'western highlands' ranging from a central area comprising: al-Daaxilijja, Haraaz, Sa^{c}faan, Hufaaʃ, MilHaan, al-Damiir, MaHwiit, Bani Sa^{c}d, Bani Hasaas, Bani

Ismaa^{c}iil, Bani Hubaiʃ, QaSaba and Bani Gaiʃ, to the peripheries, which he identifies as: Raima, Bura^{c}, ^{c}USaab and the region of Ta^{c}izz (Rossi 1937:261). By 1938, he recognised that the area was far larger than he had previously believed and indeed spilt over now and again into the eastern provinces - mainly to the east of Ta^{c}izz (Rossi 1938).

In 1960, Goitein provided a fairly detailed study of one of the 'k-dialects' based on data collected from Yemeni emigrants who had came to Israel in the 1950s. These emigrants originated from a village called al-Gades - the location of which Goitein describes as upper Lower Yemen; it lies some six hours on foot from Ibb (1960:6/356). This Jewish village was deserted at the end of 1949. In this study, he considers aspects of the phonology and morphology and concludes with a few transcriptions of recorded material.

We wait effectively thirteen years for the next European account of 'k-dialects' - and this is found in a section of Diem's useful, if somewhat inaccurate, Skizzen jemenitscher Dialekte (1973), the publication of findings made during a six week exploratory trip to Yemen in 1970. Lack of time prevented him from travelling to the north of the country and he describes the area in which the 'k-perfect' is used as the 'south west mountain range'.

Behnstedt's dialect atlas of 1985 and his latest book Die Dialekte der Gegend von Ṣa^{c}dah (1987) serve to provide us with as complete a picture as can be hoped for in regard to the geographical distribution of speakers of 'k-dialects'. While aspects of Behnstedt's field methodology have been disputed, the provision of one map (Behnstedt 1985:map 68) in which the location of all attested 'k-dialects' is depicted is an important step in Arabic dialectology, enabling us to appreciate the extent to which k is still used to denote first and second persons in the perfect aspect of the verb.

0.1.2. Dialects investigated in this thesis and the methodology:

The three dialects - Hubaiʃi, Gabiini and Kusmi - examined in this thesis are spoken in the western mountain range south of the main San^{c}aa? - Hudaida road; all fall within the 'k-dialect' group. Gabiini and Kusmi are spoken by inhabitants of the administrative centres of two of the five qaDaa? in the district (naaHijja) of Raima. The other (and, in this thesis, principal) dialect examined is that spoken by inhabitants of al-Gunaid - a village in the naaHijja of Hubaiʃ which lies some two and a half hours drive to the north west of Ibb; this dialect will be referred to as 'Hubaiʃi' after the name of the naaHijja. All three areas are located some few hours drive off the metalled road and are by all accounts 'rural'. The level of literacy, though highest amongst Gabiini speakers, is well under 10% in all areas. Despite obvious similarities, however, extra-linguistic factors differed between the regions:

1. Politically: Gabiin and Kusma are administrative centres (markaz pl. maraakiz), while al-Gunaid in Hubaiʃ is a small village.
2. Education: Gabiin and Kusma already had a history of education (albeit short), whereas in al-Gunaid the school which everyone had been waiting for was only just opening - the Sudanese teacher arrived during my second visit.
3. Foreign influence: there had been very little direct foreign influence in either Kusma or al-Gunaid (henceforth referred to as 'Hubaiʃ'), whereas in Gabiin, a foreign development health programme had been operational since 1976. While Gabiin and Kusma are both administrative centres, Gabiin is considered to be the centre of the whole naaHijja of Raima; Gabiin is far more 'cosmopolitan' than Kusma, and it is consequently Gabiin which is in

a state of flux and change, Kusma far less so. This flux reflects itself in the rate of linguistic change.

4. Geographically: although all three dialect areas are situated in the western mountain range, Hubaiʃ lies at a far lower altitude than the Raimi areas. Hubaiʃi is far more accessible to the Tihaama and, in consequence, there is more evidence of influence filtering from the Tihaami coastal region in Hubaiʃi speech than in the speech of Kusmi and Gabiini speakers.

0.1.2.1. Gabiin:

Gabiin was my home for some five months in 1986 from January to June. Owing to the potentially fast rate of linguistic change - among schoolchildren, <u>k</u> of the 'k-perfect' is already being superseded by <u>t</u> - I collected linguistic material from illiterate and semi-literate women only. Men and children would then be asked to confirm whether they would accept this speech as 'their' dialect. I lived in a Turkish fort at the top of the markaz. Women would come round to see me or I would visit them collecting data in the form of transcriptions and cassette recordings. The main topic of conversation was education and attitudes to female education, in particular.

0.1.2.2. Kusma:

Having established myself in the markaz, I moved into Kusma - some four hours drive along a rough track from Gabiin markaz, at the beginning of RamaDaan. I spent a week in the centre before moving out into outlying villages within the naaHijja. Not handled by this thesis is the amount of dialectal variation manifest within a comparatively small geographical area. I decided to take the dominant dialect of Kusma markaz as one of the three main dialects of this study, not because I felt that the other local Kusmi dialects were in any way peripheral, but rather because families I had met in Kusmi markaz moved to the capital, San^{c}aa?, where I was to spend large stretches of time during the summer of 1986. These people became my friends, were reliably available and were always prepared to answer my questions. Again, the data taken for this dialect study was that provided by illiterate and semi-literate women, which was accepted by men of the area as being 'their' dialect. The main conversation topics were attitudes to female education, health and food preparation.

0.1.2.3. Hubaiʃ:

The main dialect in this thesis is that spoken by illiterate women in al-Gunaid, a village situated some two and a half hours drive from Ibb in the naaHijja of Hubaiʃ. I studied this dialect from September 1986 until my departure from Yemen in January 1987. Initially, I stayed with a family in Ibb who had recently moved to the town from Hubaiʃ. The women took pains to nurture me into the dialect before I was introduced to the Local Development Association (LDA) representative of the village. I travelled out to the village in the beginning of October to stay in the house of the LDA representative. I paid two short visits - the first of ten days duration, the second of three and a half weeks. As I became accepted, I worked in the fields with the women - collecting wood and water, bundling sorghum stalks after the harvest, and working in the house. I would spend afternoons sitting with the women. These sessions were generally spent discussing and comparing aspects of our respective cultures. Each week I travelled to the market (suuq) with the LDA representative. I returned to my host family in Ibb to examine my data. The data collected took the form of descriptions of cooking methods, recipes, agricultural methods and method, fairy tales, children's games and traditional customs. In San^{c}aa?, I would pay visits to a number of families who had originated recently from Hubaiʃ. This was to collect more data and fill in any residual gaps I noticed at the time. The decision to choose Hubaiʃi as the main dialect was not made on the basis of visits to the village only, but also on the ready availability of willing female informants in Ibb and San^{c}aa?. This proved particularly welcome towards the end of my stay as my research permit expired and travel into rural areas became increasingly difficult for me. As in Kusma and Gabiin, linguistic material was collated by means of on the spot transcriptions and cassette recordings which were transcribed partly in San^{c}aa?, and partly in London with the help of ^{c}Abdullah al-Jarrāʃ on my return to England.

0.1.3. Cross-checking of material

Noted by most, if not all, other researchers in the field is the high degree of interest Yemenis take in their dialects and the accuracy with which they recognise and reproduce different local dialects. It was, therefore, not an arduous task either for me or for my informants to cross-check material. All collated material was cross-checked. Cross-checking would take place in the village itself - asking speaker-listeners of the dialect concerned, and outside the village - asking speaker-listeners of other mutually intelligible dialects. In particular, I remain grateful to the Ibbi family: a semi-educated family now in San^{c}aa? (the younger daughters were all at school, the eldest daughter attended a nursing college and a male cousin was at San^{c}aa? university. The father was semi-literate while the mother was quite illiterate). This family had originated from the Ibb area, then settled for some years in Kusma markaz save for a brief spell in Saudi Arabia. They provided invaluable help in corroborating or disputing my findings from Kusma, Gabiin and Hubaiʃ. There were occasions when I believe they were not correct in their analysis, but these occasions were rare. Whenever I returned to San^{c}aa? to check my data they would rally round, tell me in which area this latest data had been collected and suggest which the most relevant features were which served to distinguish the speakers of one dialect from the speakers of another.

0.2. Dialectology:

In 1925, Sapir wrote, 'Everyone knows language is variable' (cited in Chambers and Trudgill 1980:145). In spite of this acknowledgement, until recently linguists have remained determined to concentrate on the hypothetical speech of the 'ideal speaker-listener in a homogeneous speech community who knows its language perfectly and is unaffected by such grammatical limitations, distractions, shifts of attention and interest, and errors . . . in applying his knowledge of the language in actual performance' (Chomsky 1965:3). The inherent variability of language suggests that this standpoint denies the reality of language. The study of language variation whether diachronic or synchronic has remained very much at the periphery of linguistics. If linguistics is also to account for human perceptions of language, as it claims to do, language variation must shift from the periphery to become a central issue of the science. In dialectology, language variation is the central issue (Petyt 1986:46).

Dialectology is about language variation. In particular, dialectology concerns the relationship between (generally) mutually intelligible dialects of a language. In this section, I establish a working definition of 'dialect': a definition which will be intended whenever 'dialect' is mentioned throughout the following thesis. I shall then look at the development of dialectology since the nineteenth century - from dialect geography through to generative dialectology.

In 1976, Rona cites Coseriu (1955) as stating that the subject matter proper of dialectology is a set of variations, not of varieties (Rona 1976:7); however, as Rona points out, how can one study variations without first studying the varieties? And this brings me to my first problem, and the problem of dialectologists since dialectology's inception:

what constitutes a variety - what constitutes a 'dialect'?

0.2.1. What is a dialect?

E. M. Forster had once written to the effect: 'yes, oh dear, yes - a novel tells a story'. Dialectologists have had a similar sense of 'oh dear' regarding the relationship between dialectology and dialect, but for a different reason, namely the impossibility, in most cases, of defining a dialect in purely linguistic terms. In his linguistic dictionary, Crystal offers a definition of 'dialect' as:

> 'a regionally or socially distinctive variety of a language, identified by a particular set of words and grammatical structures.' (Crystal 1980:110)

0.2.1.1. The 'subjective element' in dialectology:

My thesis is that a dialect exists as an entity, not in purely linguistic terms, nor in geo-linguistic nor in socio-linguistic terms, but in the way that a speaker of a dialect is aware that he or she is speaking a dialect, and is aware that his or her dialect exists in relation to other dialects. This awareness I term the 'subjective element' in dialectology.

In 1968, Moulton so nearly approaches the subjectivity of dialectology and dialectal delineation in a beautifully human and readable style when he suggests field workers should appreciate human frailty and, in cases of doubt while determining the phonemic value of vowels, ask the informant whether two words rhyme. He then discusses the human element in language which, for him, could bar linguistics from the sphere of science:

> 'I do not know whether it is or is not a science, or whether I even want it to be a science; since it deals with man's most

human quality, namely language, I would like to think that it is in part a very human study.' (Moulton 1968:460)

He soon enthuses about the possibilities dialectology offers, emerging with the basis for Rona's three-dimensional approach to the subject:

> 'it (dialectology) is the only type of study that enables us to combine the three dimensions relevant to human language: the dimensions of time, space and the social level.' (Moulton 1968:461)

Moulton seems to be already half-way towards advocating a more subjective approach to the subject; however, the above was preceded by the following criticism of earlier dialectologists - I quote the passage in full:

> 'the traditional delimitation of dialect areas has been highly subjective and arbitrary. Ideally, an investigator might have plotted all possible isoglosses and let the dialect divisions fall where they may. In practice this was never done, since a plotting of all possibles isoglosses seemed to reveal no clear geographical structure at all and even to refute the very notion of 'dialect area' - which was what the investigator set out to demonstrate in the first place. Accordingly, what the investigator did was to develop some sort of intuitive idea of the areas he wanted to find; he was then able to pick and choose isoglosses that could be patched together so as to reveal the desired areas.' (Moulton 1968:456)

I have cited the whole passage in order to illustrate how Moulton is right that earlier dialectologists were mistaken in their methods of dialect delimitation; however, they were mistaken, not because they approached the problem from a subjective viewpoint, but rather because they did not take into consideration the subjective viewpoint of their informants. As he continues to say that structuralists use an entirely different approach by setting out and considering phonological data - which needs to be objective - he seems to be unaware that the decision to concentrate on one aspect of data rather than another must indicate subjectivity on the part of the researcher.

As early as 1955, Coseriu stated that dialects don't exist until they have been delimited by the dialectologist (Rona 1976:13). Subjectivity in dialect delimitation is not only evident on the part of the speaker-listener, but also on the part of the researcher. The subjective element of dialectology on the part of the researcher was recognised by an investigator conducting field-work in Sudan:

> 'Supposing we choose to do a dialect study of a few villages on the White Nile in the Sudan. In those villages, there may be people who have spent periods in Khartoum, and whose pronunciation is influenced by Classical Arabic, because of their religious interests; similarly, those encountered in the modern sector may speak a language influenced by the modern written language, and so on. If, as linguistic investigators, we are solely interested in the pristine dialect of these villages, we must ignore these other speakers, or we must, at least ignore the things they say which are, we believe, incompatible with the pristine dialect. This, however, involves making a series of complex judgements, one aspect of which is that we, ourselves, must select what is to be counted as data and what is not. (Dickins, forthcoming)

0.2.1.2. Intra-variety variation:

Variation is intrinsic. It exists, not only between neatly bounded circumscribed linguistic and geographical areas, but also across and within idiolects. Labov goes some way towards removing false faith in the consistency of 'idiolect' as a system with his early work in Martha's Vineyard and New York in the sixties:

> 'It is generally considered that the most consistent and coherent system is that of an idiolect .... (however) most idiolects do not form a simple, coherent system; on the contrary, they are studded with oscillations and contradictions.' (Labov 1966:6-7)

And so, if we are to discuss linguistic varieties it must be accepted that, in addition to inter-variety variance, a great deal of linguistic difference will manifest itself within the varieties. In a passage cited by Bailey, we read how intra-variety variation was already obvious to Schuchardt in 1885:

> 'the old and the new appear distributed within a dialect, however, not only according to age, but also according to sex, education, temper ... in short, in most diverse ways.' (Schuchardt (M-15), cited in Bailey 1973:15)

Any linguistic variety comprises a set of chosen varieties. Some consider that a dialect comprises a set of idiolects; thus Bloch states:

> 'A class of idiolects with the same phonological system is a dialect' (Bloch 1948:8).[1]

1. Note that Bloch does admit that speakers of a single dialect may differ in terms of 'vocabulary and grammar' while speakers of a different dialects may agree in all respects 'but for some small detail of pronunciation' (Bloch 1948:8).

However, as Labov points out, there is almost invariably more variation within what is accepted to be an idiolect than within what is accepted to be a particular dialect (Labov 1966:6-7).

0.2.1.3. Replacement of the term 'dialect'?

Bailey and Bickerton, due to the 'freezing' connotations associated with 'dialect', reject the term, replace it by 'lect', and discuss variation as represented on a pan-lectal 'grid' of all possible 'isolects' - they also discard the term 'idiolect', then coin 'isolect' which does not fully coincide with the latter (Bailey 1973:11). In the following description of Bailey's grid, 'idiolect' should be read as 'isolect':

> 'the various lects in a panlectal grid are implicationally related to each other; each is essentially an individual grammar - a set of rules - and (since each idiolect differs from those on either side in respect of just one rule difference) any lect implies the set of rules of the lect 'before' it on the continuum ... lects are held to be related not only synchronically but also historically.' (McDavid 1986:50)

Rona, having delimited three types of dialectology, terms the third, which crosses the first two types - vertical social and horizontal geographical - 'sociodialectology'. The varieties it deals with he terms 'sociolects' (Rona 1976). Hoppenbrowers, in a study of south eastern Dutch dialects preserves the term 'dialect', and offers the following re-definition:

> 'we view dialects as a complex network of similarities and differences which overlap in such a way that no two idiolects are necessarily identical, but in which there is enough similarity among the dialects in a speech chain so that speech

can always be processed by means of phonological strategies.' (Hoppenbrowers 1982:61)

I see no reason to invent new terms. I see no reason to invent new terms because I believe it is impossible and undesirable to isolate the separate dimensions intrinsic in variation. We simply need to re-define. I see 'dialect' as a reality on the three-dimensional scale - time, social and geographical with a further dimension being the speaker's/s' mind.

0.2.2. Definitions of 'dialect' amongst investigators today:

There is, however, still a nagging persistence on the part of the dialectologist to refer to a 'dialect' as a discrete, objective linguistic unit bounded neatly and geographically. In 1973, Diem produced his Skizzen jemenitischer Dialekte in which he describes dialectal aspects of several regions in Yemen - and claims to describe the 'dialects': notes on the type of informant are few, but enough to inform us that many of the areas for which he collected data he did not even visit (Diem 1973). Jastrow summarises Diem's methods of data collection, whereby the data:

> 'aus verschiedenen Dialekten, die vom Verfasser größtenteils an Ort und Stelle oder aber mit Hilfe von Informanten aus nicht selbst besuchten Gegenden zusammengestellt wurden.' (Jastrow 1977:292)

At one point, it is mentioned that the informants were young girls who had recently moved to Beirut and 'had maintained their speech pattern'. Other informants, we discover later, were taxi drivers.

Behnstedt, with his Yemeni dialect atlases (1984, 1985), provides invaluable insight into the geographical distribution of certain linguistic features, on the one hand, yet, on the other, he entrenches further the notion that dialects emerge from sand and rocks rather than from speech communities. He does not detail methods of data collection or type of informant, and so, from his dialect atlases is it to be presumed:

i. that the linguistic item in question was collected 'an Ort und Stelle' from a speaker born to the area?

or ii. that the item in question was heard in the area and, that therefore, its use could be due to extra-linguistic (or geographical?) factors?

or, further, iii. that the item was extracted from an informant who claimed to be from the area yet was interviewed outside it - as with Diem's informant from al-MaHall, Gabal Raima who was interviewed in San^{c}aa? ?

Behnstedt does not delimit discrete dialects and also decides against isoglosses:

> 'auf Isoglossenkarten habe ich verzichtet' (Behnstedt 1985:5) [1.]

He provides points; Diem does not delimit dialects, but describes them and, thus, accepting their existance a priori, somehow claims to delimit. The methodologies adopted by Behnstedt and Diem are similar: a place is visited for a short period; informants are interviewed on the basis of whether they seem to exhibit mastery of the local 'dialect'; informants are interviewed 'an Ort und Stelle', or elsewhere, depending on time and opportunity; a pre-determined questionnaire is used; the information extracted is presumed, either, to indicate the existence of a certain speech variety in a certain area - in the case of Diem - or, to indicate both

1. However, refer to his maps on 'k-dialect', 'the definite article', 'qāf' where the maps depict a defined fade-out area of feature. If an area in which a dialect feature fades out is <u>not</u> described as 'isogloss', how should it be interpreted?

the existence of a certain number of speech characteristics in a certain area, and the areal distribution of isolated differences - in the case of Behnstedt. Let us review these points individually:

i. A short visit may be sufficient to establish points of outstandingvariance, but cannot allow the researcher insight into, either subtle community external comparative, or community internal variance;
ii. In this case, how can one determine the 'ideal' informant - one who exhibits mastery of the speech variety under investigation - if one does not recognise, and through lack of time, necessarily cannot recognise, the salient linguistic points of that variety?
iii. Informants are interviewed either 'an Ort und Stelle' or elsewhere - if they are not interviewed in the place itself, how can it be claimed that the 'dialect' or 'dialect feature' recorded stems from the area?
iv. In view of the traditional notion of dialects as varieties of a language separated by bundles of covarying phenomena, it seems, at the very least, contradictory to refer to isolated linguistic differences as 'dialectal' (Bailey 1973:10).
and, v. Let us finally look at the matter of questionnaire where, in both cases, a pre-determined questionnaire was used: experience shows that questionnaires should be treated like falsifiable theories: a hypothesis leads to a theory which is subjected to trial, partially falsified, modified through a second hypothesis which, in turn, leads to a theory, is trialled, partially (or otherwise) falsified, modified through a third hypothesis and so on, cyclically.

On a short research trip - Diem was a member of the six-week long Deutsche Forschung Expedition 1970 - it is not possible to subject the questionnaire to constant revision, and yet, if the questionnaire is not constantly revised, the resultant picture will be forced and false. Gilliéron suggests that:

> 'le questionnaire ... pour être sensiblement meilleur, aurait dû être fait après l'enquête.' (Gilliéron 1915:45)

No account has been taken of attitudes. Subjectivity on the part of either speaker or researcher has been gently tucked out of view. Although the field methodology used by both investigators was similar, the values of the resultant works - in particular, for the future of linguistic research in the region - are quite different. The value of Behnstedt's dialect atlas is essentially difficult to determine. We are deceived visually. What we can say, with some certainty, is that the features recorded by Behnstedt are to be found, at some time, in the speech of Yemeni Arabic speakers within and without the borders of North Yemen. We can not say that the geographical distribution of these features has, or indeed in any dialect atlas could, with full accuracy have been measured. Perhaps the greatest danger of a work like this lies in the feeling the reader gains on perusal - that the research and recording has been done; the work has already been covered; we, therefore, need do no more. And Behnstedt says there is no need to repeat a work of this type in Yemen. Diem's task and effect, on the other hand, were quite different: as he claimed to do little more than indicate the presence of certain linguistic features within certain geographical boundaries, his work served to arouse interest in the area, to discover linguistic features that he can only hint at.

0.2.2.1. Dialects have been considered to be objectively discrete units fenced in by sharp isoglosses. Dialects have also been considered to exist on a dialectal continuum:

> 'the search for discrete geographically defined dialects is probably a fruitless one in the majority of linguistic landscapes' (Ingham 1982:27)

Ultimately, whether they are seen on a continuum or as discrete units, dialects have been considered objective linguistic units mapped on a unidimensional geographical plane. Dialectal variation has been observed as an objective reality on the horizontal unidimension. Dialectology has encouraged this view of objectivity in order to be considered 'scientific' - cf. Moulton's criticisms of earlier work above (Moulton 1968:456). With Labov's insights of the 1960's and 1970's there are now two disciplines: one which regards language variation on the vertical or social plane; the other which concerns itself with the horizontal or geographical plane - as above. In the former, it is the geographical variable which is 'controlled', in the latter, the social variable. In both cases, the interdependance of the dimensions and the 'third' dimension of subjectivity intrinsic to language varieties and language variation is denied. In neither case is there provision for the crossing of dimensions - and yet, in 1968, Moulton was already alluding to the three-dimensionality of dialectology.

0.2.3. A definition of 'dialect':

Dialects do exist, and I shall continue to use the term 'dialect'. Dialects exist on the multi-dimensional scale; and although we may wish to control all variables, we cannot. We cannot control all variables because the third dimension, the subjective element implicit in language variation, is beyond control and unpredictable. We can simply make frequent reference to speaker-listener attitude, and direct our attention to it. A dialect is a dialect, not more or less, but discretely, because it exists as a psychological reality in the minds of its speakers and in the minds of speakers of other dialects in relation to other dialects. Although a dialect is not a dialect simply due to linguistic facts, it can be delimited linguistically by the dialectologist who relies on the attitudes of her/his informants, on the one hand, and on his/her personal judgement, on the other. Just as no one idiolect remains uniform over any length of time, and since no two idiolects are identical, so each 'dialect' must incorporate a number of non-identical speech varieties. For each dialect there must be delimitation of a set of sufficiently homogeneous subjectively-defined varieties (Rona 1976:11). The degree of accepted linguistic variation within one speech variety is very much determined by the acceptance levels of (older) people in the community. In addition to speaker-listener attitude, the dialectologist must consider and state precisely the linguistic criteria on which s/he bases judgement - whether those criteria are phonological, lexical or syntactic.

0.2.4. 'The Abruptness Principle':

One of a number of residual questions is how to view the concept 'dialects' in relation to the concept of 'dialectal features on a continuum'. Evidence shows that linguistic transitions between varieties are not usually abrupt, but gradual - such is the case with the monophthongal/diphthongal vowel differentiation in Swiss German (Moulton 1968:457). Ingham, discussing the dialects spoken in North East Arabia, says that it is difficult, almost impossible, to delimit discrete dialect units (Ingham 1982:27). However, in saying that dialectal divisions are impossible to delimit, consideration has always been restricted to the objective quantifiable facts of linguistic differences and variation; no account is being taken of the empirical evidence of subjective and psychological factors which inform us that our perception is not gradual, it is abrupt. If dialects exist, as I maintain they do, as psychological realities in the minds of speakers, then we must accept what I shall term 'the abruptness principle' in dialect delimitation, however gradual a given instance of phonological change may appear to be.

0.3. Dialectology: the state of the art

In spite of the overriding interest in dialect variation throughout history, the first systematic thrust to studying dialects did not begin until the latter half of the nineteenth century. Until this time, the characterisations of dialect areas remained casual and isolated.

0.3.1. Dialect geography:

Dialect geography, which took the form of dialect atlases on the whole, rose to the challenge posed by the Neogrammarians' claim that: 'sound changes are exceptionless'. The Neogrammarians' search for general principles of language change came up with Verner's Law which successfully eliminated the largest set of exceptions to Grimm's Law by demonstrating that so-called exceptions exhibited lawful properties. To 'prove' or 'falsify' this claim nothing could be more appropriate than large collections of dialect data.

The first significant dialect atlas was begun in 1876 by Georg Wenker in Germany. Between 1877 and 1887 questionnaires were mailed to 50,000 schoolteachers, 45,000 were returned completed (Chambers and Trudgill 1980:18). The next atlas to be produced was the famous French dialect atlas initiated by Gilliéron in 1896; the data for this was collated by Edmond Edmont as he cycled round 639 sites interviewing 700 informants between 1896 and 1900 (Gilliéron 1915, Chambers and Trudgill 1980:21). Since then, dialect atlases have been produced for Italy, Switzerland, the United States and Canada and Scotland, amongst other places. The production of dialect atlases reached its height during the first half of the present century, since then the costs and drawbacks of dialect atlases have meant a decline in interest. Recently, however, dialect atlases have been produced for parts of the Arab-speaking world - Egypt (Behnstedt and Woidich 1985), the Yemen Arab Republic (Behnstedt 1985) and Syria (Behnstedt, forthcoming).

0.3.2. Structural dialectology:

The main criticism levelled against dialect geography towards the middle of the present century was that it was too atomistic in its approach. Dialectologists were frequently regarded as 'mere butterfly collectors' treating linguistic forms in isolation rather than as parts of systems or of structures (Chambers and Trudgill 1980:28). Structural linguistics had, by this time, advanced a long way. In 1954, Weinreich attempted to reconcile the two areas of general linguistics and dialectology by considering the question: 'Is a structural dialectology possible?' in an article of the same name. The chief problem, at the time, was that linguists did not consider it meaningful to make comparison across different language systems. Weinreich, however, showed that inter-systemic comparisons could be both meaningful and revealing. He set up the notion of a 'diasystem' by which partial similarities and partial differences of related language varieties could be observed. Given the lexical items 'boot', 'nose', 'knows' and 'house' in Lowescroft and Ipswich which appear as follows:

Ipswich		Lowescroft	
/u u/	boot	/u u/	boot
/o u/	nose, knows	/o u/	nose
/a u/	house	/ʌ u/	knows
		/a u/	house

Weinreich set up the following diasystem:

$$L/I \; // \; \text{u u} \approx \frac{\text{L ou-ʌu}}{\text{I ou}} \approx \text{a u} \; //$$

It was felt that:

> 'a diasystem is experienced in a very real way by bilingual (including 'bidialectal') speakers and corresponds to what students of language contact have called a 'merged system'. (Weinreich 1954:390)

Structural dialectology was attempting to do more than simply record isolated linguistic facts: it was considering and comparing the systems of two related language varieties, on the one hand, and was attempting to establish a system which constituted, in some way, a psychological reality to the speaker-listener, on the other hand. There were, however, drawbacks with the structural diasystemic approach: while the phoneme inventory in terms of the number and identity of phonemes could be handled, neither differences in phoneme distribution nor in phoneme incidence could be displayed by the diasystem.

0.3.2.1. Lexical correspondences:

Weinreich had considered the phonemic inventory only. By examining lexical correspondences, Moulton went some way to enhance the usefulness of structural dialectology. He realised that mere phonetic similarity was not enough: two dialects may share seven short vowel phonemes, however, these phonemes may not be distributed through the same set of lexical items. By considering lexical incidence, Moulton illustrates that related varieties are descended from a common source and differ as a result of different language changes. He continues to use the diasystem and employs numbers to illustrate cross-dialectal correspondences, viz:

$$\text{RP, Norwich} \;//\; \frac{\text{N uu } 1,2 \approx \text{uu } 2,3 \approx \text{ou } 4 \approx \text{ʊ } 3,5}{\text{RP juu } 1 \approx \text{uu } 2 \approx \text{ou } 3,4 \approx \text{ʊ } 5} \;//$$

While this numbered diasystem does show correspondences between the dialects, it fails to illustrate precisely which lexical items have a particular vowel. This particular diasystem does have the additional disadvantage of suggesting that RP and Norwich dialects do not share a single phonemic unit. Pulgram complained that:

> 'a diasystem that takes into account certain conditions which historical linguists, dialectologists and the speakers will regard as indispensable and that then shows so little agreement between closely related dialects as to make them seem foreign to one another distorts the facts.' (Pulgram, cited in Chambers and Trudgill 1980:44-5)

Another criticism of the diasystem was that, just as two closely related dialects could be made to appear foreign to one another, so diasystems could be constructed for two dialects of totally unrelated languages. Finally, use of the diasystem restricted the number of varieties that could be handled at any one time to two.

0.3.3. Generative dialectology:

The advances of transformational grammar and generative phonology began to make themselves felt in dialectology by the 1960's. The structural diasystem was too constraining and had many disadvantages. In 1962, Halle wrote an article entitled 'Phonology in a generative grammar' in which he examined the possibilities of establishing a generative phonology which would handle more than one language variety (Halle 1962:54-72). He claimed that dialectal variation may result from either:

i. Different grammars containing different rules;

or, ii. Different grammars having differently ordered rules.

Generative dialectology was considered very attractive at first: while structural dialectology could handle a maximum of two dialects, this latest approach could handle a potentially infinite number of related language varieties. Not only could the new theory deal with dialectal variation, generative dialectology also offered an explanation of how speakers of different but related dialects understand each other and communicate - for mutually intelligible dialects of a language were considered to share underlying phonological representations. In many cases, only the ordering or degree of generality of the phonological rules was felt to differ.

0.3.3.1. A common underlying representation:

Problems did emerge with the new theory, however. The major problem concerned the establishment of a single underlying phonological form or representation from which all dialectal variants could be derived predictably. As Petyt observes:

> 'the whole idea of a common underlying form for all dialects is one which is superficially attractive, but it leads to considerable problems in certain areas.' (Petyt 1986:46)

It was found that the common underlying representation would either be far closer to the form of one of the dialects than to that of the others such that one or more dialects would be seen to be derived from another, or that the representation was so abstract that it required a series of complicated rules to derive all realised dialectal forms. Brown recognised this problem in her attempt to construct a common underlying representation for the Northern and Southern dialects of Lumasaaba:

> 'I found . . that the neutral forms I managed to construct did not resemble any known phonological system, and that parity of derivational difficulty, as between the two realisations, was only achieved by constructing long and difficult derivations for both South and North.' (Brown 1972:168-9)

She eventually took the Northern form as the underlying representation for reasons of simplicity:

> 'It turned out that fewer rules were needed if a Northern form was taken as the base form, and that these rules were much more general.' (Brown 1972:169)

Brown does see the drawbacks in taking the form of one dialect as the common underlying representation:

> 'It is not suggested that the model of common Lumasaaba phonology outlined here bears any relation to the process of language acquisition or production for any speaker of any dialect of Lumasaaba. Such a suggestion would be especially intolerable in the case of speakers of Southern dialects, since Southern dialects are being explicitly derived from (and compared with) the output of Redundancy Rules especially designed to yield a correct specification for Northern dialects.' (Brown 1972:147)

However, if the model is not designed to deal with the process of language production for any speaker of any dialect of Lumasaaba, then the purpose of the model is tenuous at best.

O'Neill is not aware of any drawbacks in the construction of a common underlying representation. He adopts the form of one dialect of Modern Faroese as the underlying representation from which all dialects of the language are derived:

> 'We begin by presenting the matrix description of South Streymoz Faroese because the other dialects can be most simply presented in the form of rules that show in what ways they depart from the Torshavn system.' (O'Neill 1963:395)

Newton, in his study of Modern Greek dialects takes a historically reconstructed form ('Koine', based on Attic) as the underlying representation. Although he is looking at dialects as they are realised today, he apparently takes a historical perspective and sees dialectal variation as:

> 'the outcome of historical changes acting on an originally uniform language rather than as a conglomeration of static self-contained systems.' (Newton 1972:1)

He continues:

> 'because dialects arise from an originally more or less uniform language it is possible to show that they can for the most part be described in terms of a common set of underlying forms: variation is introduced by the phonological processes which operate on these forms.' (Newton 1972:5)

In Newton's case, he tends to confuse diachronic and synchronic aspects. He claims that the common underlying representation is applicable for all dialects today. However, he appears to be conducting a historical reconstruction of dialectal development.

There are attractions in the notion of establishing a single phonological representation from which all dialectal variants can be derived. Certainly, more than two related dialects may be compared in the generative approach. The problems inherent in such an approach, however, tend to minimise its usefulness. Generative dialectology suffered from overambition. Main criticisms levelled against the generative dialectology approach may be summarised as below:

Frequently diachronic and synchronic aspects of dialectal variation are confused, as seen in the case of Newton, above. When the form of one dialect is taken as the common underlying representation for reasons of simplicity, the diagrammed derivation rarely bears any relation to the way in which dialect speakers actually derive their forms (cf. Brown 1972:147). It is, therefore, difficult to claim that the models established are in any way 'psychologically real'. When a neutral (i.e. totally hypothetical/abstract) representation is constructed, this representation often fails to resemble any known phonological system and the rules required to derive realised forms may be exceedingly complicated.

0.4. The present model:

While it is believed here that the general aims of generative phonology are essentially correct, generative phonology as it has been applied to dialectology has failed to provide a psychologically plausible account of dialectal variation. The main reason for this is probably over ambition. Failing in its main aims to characterise synchronic inter-dialect relatedness and the mechanics of mutual intelligibility, it succeeds only in a confusion which merges the diachronic and the synchronic. A more concrete approach to dialectology is called for: an approach which examines the different levels of the grammar in which variation may and does take place.

The approach I propose here is based on the contributions of autosegmental phonology, especically in its application to nonconcatenative morphology, lexical phonology, underspecification theory and feature geometry. It aims to represent mutually intelligible dialects of a language as networks of similarities and differences, nothing more. No attempt is made to produce (more or less) abstract common underlying representations from which all dialectal forms in a language are derived. The study is purely synchronic, and, while diachronic considerations may be raised for illustrative purpose on occasions, the overriding aim is to determine how speakers of three Yemeni dialects - Hubaiʃi, Kusmi and Gabiini - derive their own forms today: lexical representations may indeed be identical, as in the case of the Kusmi and Hubaiʃi [first singular] subject pronoun in the perfect aspect of the verb (cf. chapter eight); equally, they may be different, as in the case of the [feminine singular] morphemes in these dialects (cf. chapter six).

0.4.1. Theoretical background:

The approach of this thesis looks at dialectal forms from an autosegmental viewpoint. Nowadays, phonology places greater emphasis on representations than on rules. This shift will be reflected in dialectology wherein increasing emphasis is placed on distinct representations as opposed to distinct rules and/or distinct rule ordering. Variation is shown to occur at different levels of the grammar in accordance with the central claim of lexical phonology. All the approaches which contribute towards this model do, of course, fall under the general umbrella of generative phonology.

0.4.1.1. Autosegmental phonology:

Although autosegmental phonology was first applied formally (as suprasegmental phonology) to tone and nasalisation in some languages by Leben in 1973 (Leben 1980), the idea behind autosegmental phonology was born far earlier - in particular, in the recognition of suprasegmental phenomena. In standard phonological theory the phonological string is divided into a linear arrangement of segments and boundaries (van der Hulst and Smith 1982:3). However, it was soon recognised that the 'scope' of many features is not necessarily restricted to one phoneme, and may be less than one phoneme. The recognition of both <u>sub</u>segmental and <u>supra</u>segmental phenomena has led to the untenability of a 'strict segmental theory' which divides phonological forms vertically into discrete segmental units (van der Hulst and Smith 1982:3), termed by Goldsmith the 'absolute slicing hypothesis' (Goldsmith 1979:17ff.).

Harris in 1944 notes that a phonological string may be sliced both vertically into successive segments, and horizontally into simultaneously occurring components, some of which span more than one phoneme. Thus he analyses Moroccan [DaR] 'house' as composed of two simultaneous parts: a regular consonant-vowel sequence and an 'emphatic' - i.e. pharyngealised, component. For English, he says:

> 'we say that /ŋ/ and /k/ each contain a certain component (say, back position) and that this component spreads over the length of two phonemes when the first is nasal: /nk/ ... nor /ŋt/ occurs because the component of the mouth position always extends identically over both phoneme places.' (Harris 1944:192)

He continues:

> 'If we mark N for nasal without regard to mouth position, and S for stop without regard to mouth position, and - for alveolar and _ for velar, then we may say that the latter two markers always have a 2-phoneme length when the first is /N/. Thus /-NS/ = /nt/ and /_NS/ = /ŋk/.' (Harris 1944:192)

'Suprasegmental phonology' was first formalised by Leben in 1973 in order to solve tonal problems in various languages in which tonal melodies may carry grammatical meaning: these problems included the presence of contour tones attested on short vowels by a number of linguists (cf. Leben 1980:36): segmental theory does not allow sequences of features on one segment, so if a contour tone is to be represented as a sequence of level tones, eg. [+H,-H], as has been suggested by Woo (1969, in van der Hulst and Smith 1982:6), then problems arise in terms of the standard theory, since a segment cannot be marked both '+' and '-' for a feature (Goldsmith 1979:22, following Chomsky 1955). Another problem was that in several languages, certain tonal patterns are found which may occur on words with differing numbers of syllables, and, conversely, certain tonal melodies are never attested: thus, in Mende, for example, the tonal pattern LHL occurs on words of one, two or three syllables irrespective of segmental information; no lexical item in Mende, however, can have the tonal pattern HLH (cf. Leben 1980:27). To solve these problems Leben places tonal features on a suprasegmental tier and segments come to bear tone specifications by being associated with tones.

In Goldsmith (1979),'autosegmental phonology' is introduced to replace the term 'suprasegmental phonology', since, while suprasegmental phenomena - such as nasalisation, tone and pitch in some languages - are distinct from segmental phenomena in terms of the latter's segmentation into phonemes, if the segmentation of pitch, for example, forms a sequence of tonal segments, then the term '<u>supra</u>segmental' is misleading (Goldsmith 1979:20). With autosegmental phonology Goldsmith sets up parallel autonomous sequences of segments, none of which 'depend on' or 'ride on' the others. These are termed autosegmental levels. For example, in tone languages tonal features are factored out to another level, eg:

```
a k a l a
|   |  /\
L   H L H
```

where 'a' of the third instance has a sequence of $\begin{bmatrix} +\text{hipitch} & -\text{hipitch} \\ -\text{lopitch} & +\text{lopitch} \end{bmatrix}$

(Goldsmith 1979:23)

Similarly, Goldsmith factors out intonation patterns in English, eg.

```
b a l l *o o n
        /  |
      H*   L   (Goldsmith 1979:27)
```

Not only does the autosegmental approach allow contour tones to be represented as sequences of level tones, and account for the occurrence of certain tonal melodies on words with differing numbers of syllables irrespective of segmental information, but also, since the tonal tier is autonomous from the segmental tier, a segmental change does not necessarily imply a tonal change. Autosegmental phonology predicts that it is more complex to delete both a segment and a tone than just a segment (cf. Kenstowicz and Kisseberth 1979:284). This provides an explanation for tone stability, attested in a number of languages such as Lomongo and Makwa (cf. Kenstowicz and Kisseberth 1979:276), which results when the vowel is deleted but not its tone. Tone stability cannot be predicted if, as in the segmental approach, the tone constitutes part of the segment.

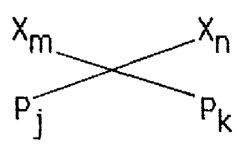
In an autosegmental approach the association of autosegments on different tiers must be accounted for. As can be seen in the examples akala and balloon given above, the association of tone or intonation features with segments may apply on a one-to-one, one-to-many or on a many-to-one basis. Association is, however, constrained in these earlier versions of the theory by the Well-formedness Condition, viz:

0.4.1.1.1. Well-formedness Condition

Association lines cannot cross.

(Leben 1980, Goldsmith 1979:27, Clements and Ford 1979:182, van der Hulst and Smith 1982:14, Archangeli 1984a:17, Cole 1987:13)

The Well-formedness Condition states that where m is less than n and j is less than k, the following association is ill-formed:



Therefore, the following association of tonal features with the word akala would be ruled out by the Well-formedness Condition, viz:

a k a l a

H L LH

McCarthy develops the autosegmental model further and demonstrates that the phonological segment must be decomposed into a timing slot (C or V) and one of more melodies (McCarthy 1981). The various melodies comprise all the distinctive features that make up the segment. As a theory originally designed to 'solve' tonal problems, autosegmental phonology developed into a theory of tone (van der Hulst and Smith 1982:29) and was extended to deal with other phenomena which have been traditionally considered suprasegmental (such as intonation, vowel and nasal harmony, length, 'emphasis' in Arabic). A clear account of assimilation processes is also provided in the autosegmental framework. In this case, assimilation can be shown to be the multiple linking of segments to autosegmental features in autosegmental phonology; for example, a rule of nasalisation such as occurs in English 'soon' [sũn] is represented as a nasal autosegment linked to a nasal consonant spreading onto a preceding vowel, viz:

[+nasal]

V C (Cole 1987:14)

Autosegmental phonology has not only been applied to what has been commonly accepted as being <u>supra</u>segmental, but is also extended to deal with <u>sub</u>segmental phenomena, such as complex consonants and short diphthongs. In this case, two fully specified segments are represented on one autosegmental tier and are linked to a single 'segmental slot', and are seen as branching segments, viz:

C V C

b m [bm] e i [ei] p f [pf]

(postnasalised stop) (short diphthong) (affricate)

(Clements and Keyser 1981, in van der Hulst and Smith 1982:19)

0.4.1.1.2. Association in autosegmental phonology:

If a language has several autosegmental tiers (eg. a tonal tier, a harmony tier, a segmental tier), how are these different tiers related to each other? The several autosegmental tiers may either be piled up on top of each other, or be related by means of a basic tier (van der Hulst and Smith 1982:14). In recent work in autosegmental phonology, it is assumed that there is a basic autosegmental tier with which all other tiers come to be associated by means of association conventions. This basic tier consists of the major class features [consonantal] and [vocalic] and takes the form of a string of C and V elements, such as 'CVCCVCVVCC..' - i.e the CV template (Clements and Keyser 1983, McCarthy 1981, 1982, 1985, 1986, van der Hulst and Smith 1982:24) - or, in more recent works, a sequence of X slots and rhyme-headed X slots - i.e. the skeletal 'X' template (Levin 1983, Archangeli 1984a, Cole 1987, Pulleyblank 1988 etc.). The phonetic content of the slots on the basic tier is given in two separate tiers or melodies - one for consonants and the other for vowels. The vocalic tier is defined by the vocalic melody and by the anchors (Vs). The consonantal tier is defined by the consonantal melody and by the anchors (Cs). It appears, though, that the number of tiers that may be associated with the basic tier is only limited by the number of possible phonological gestures (van der Hulst and Smith 1982:24). Any tier is arguably separate at the underlying level if the lexical entries of morphemes may be defined on it (Hayes 1986:474). The association of elements between any of the autosegmental tiers and the basic tier takes place in accordance with the Well-formedness Condition (as detailed above, 0.4.1.1.1.), in addition to Universal Association Conventions, and the Obligatory Contour Principle, viz:

0.4.1.1.2.1. Universal Association Conventions:

In this model, I shall follow McCarthy in assuming that association between autosegmental tiers is governed by the theory of tonal association adopted from Clements and Ford (1979) (Clements and Ford 1979:182-186, McCarthy 1982:194). This accepts three Universal Association Conventions for the association of tones (t) with tone-bearing units (T). These are diagrammed below:

i.

$$\begin{array}{ccc} T_i & T_{ii} & T_{iii} \\ t_i & t_{ii} & t_{iii} \end{array} \;\text{-->}\; \begin{array}{ccc} T_i & T_{ii} & T_{iii} \\ | & | & | \\ t_i & t_{ii} & t_{iii} \end{array}$$

ii.

$$\begin{array}{ccc} T_i & T_{ii} & T_{iii} \\ t_i & t_{ii} & \end{array} \;\text{-->}\; \begin{array}{ccc} T_i & T_{ii} & T_{iii} \\ | & & \\ t_i & t_{ii} & \end{array}$$

iii.

$$\begin{array}{ccc} T_i & T_{ii} & T_{iii} \\ t_i & t_{ii} & \end{array} \;\text{-->}\; \begin{array}{ccc} T_i & T_{ii} & T_{iii} \\ | & | & \\ t_i & t_{ii} & \end{array}$$

i. provides for left-to-right association of several autosegments with several unassociated autosegment-bearing units, as in the Universal Association Convention of Archangeli (1984a:17), Pulleyblank (1986:31) and Broselow (1984:16). ii. gives precedence in spreading to an unassociated autosegment over one which already bears an association (possibly by the prior application of a language-specific rule). iii. makes sure that all autosegment-bearing units will have at least one association (though not the converse) garnered, if necessary, from the melodic element on the left (McCarthy 1982:195). These conventions are a revision of clauses 1) and 2) of Goldsmith's Well-formedness Condition (cf. Goldsmith 1979:27, Clements and Ford 1979:182, van der Hulst 1982:14) which reads:

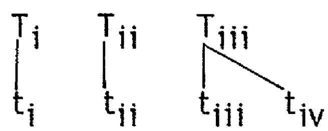
The Well-formedness Condition:

1) Each tone is associated with at least one segment.

2) Each segment is associated with at least one tone.

3) Association lines do not cross.

Clements and Ford argue that the WFC in respect of clause 1) is too strong. Under Goldsmith's proposal, tones which remain unassociated following the left-to-right association of tones with tone-bearing units on a one-to-one basis (as in Clements and Ford's UAC i)) multipally associate with the final tone-bearing unit, viz:



Evidence from a number of languages suggests, however, that such tones should not be (re)associated as a matter of course. Clements and Ford claim that where no language-specific rule is available to associate these tones they remain unassociated and receive no phonetic content (Clements and Ford 1979:182ff., van der Hulst and Smith 1982:14).

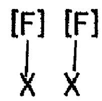
0.4.1.1.2.2. The Obligatory Contour Principle:

The Obligatory Contour Principle restricts the occurrence of identical elements in sequence on any autosegmental tier. The Obligatory Contour Principle in this model is adopted from McCarthy and is a revision from Leben (1980, in Goldsmith 1979:36), viz:

In a given autosegmental tier adjacent autosegments are prohibited. (McCarthy 1985:238, 1986:208, and cf. Schein and Steriade 1986:698)

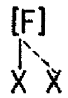
Therefore, the representation, a)

a)

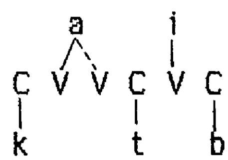


is said to be less highly valued than the representation, b)

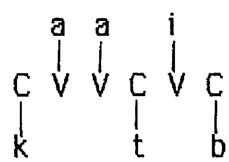
b)



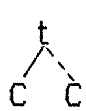
and where two identical elements are brought together on any single autosegmental tier, as in a), the OCP brings about simplification to b). For example, the unmarked representation for <u>kaatib</u> 'writer' in Arabic is given as below, viz:



And not as in the representation:



Geminate consonants are similarly represented as a single element of consonantal melody associated to two 'C' slots, as in the case of geminate [tt], viz:



Such segments typically resist being split by epenthesis because any inserted vowel will cross association lines with the geminate segment, thus violating the Well-formedness Condition (0.4.1.1.1.), viz:

```
* t  a

  C  V  C
```

(and cf. Schein and Steriade 1986:692)

(Note that this assumes a linearization of vocalic and consonantal tiers by the time of epenthesis:

```
  t
C   C
```

would not be inviolate from a separate tier,

viz:

```
  t

C V C

  a )
  ↑
  ep.
```

Consider the following derivation of the Yemeni verbal form, simi^{C} 'he heard'. The basic tier expressing the morphological template for this verb form – the first binyan (cf. McCarthy 1981, 1982, 1985, 1986) – is posited as below:

```
C V C V C
```

The lexical entry for simi^{C} is given as:

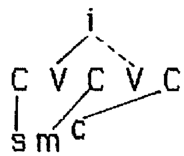
```
  i
s m C
```

By convention, the vocalic melody tier is represented above the template, the consonantal melody tier below, viz:

```
    i
C V C V C
s m C
```

Elements from the consonantal melody associate in accordance with the

Universal Association Conventions (i.) on a one-to-one basis, from left-to-right with C slots. The vocalic element, /i/, associates with the left-most V slot and spreads, in accordance with the Universal Association Conventions (iii.), onto the unassociated V slot, viz:



This provides the output [s i m i ^{c}] 'he heard'.

0.4.1.2. Nonconcatenative morphology:

In 1979, the concepts of autosegmental phonology were extended naturally to account for morphemes in those language systems which can not be easily reduced to ordered strings of morphs. McCarthy demonstrates the potentials of the autosegmental framework by applying the principles to languages with nonconcatenative morphological systems such as Arabic and Tiberian Hebrew. He notes that the segmental slicing of words in these languages fails to reveal the necessary generalities: taking the Classical Arabic form <u>kataba</u> 'he wrote' it is observed that any attempt to divide the word vertically yields six elements, none of which (bar, of the third instance, 'a' (third masculine singular)) bear any meaning in isolation:

+ k + a + t + a + b + a +

Only by stating that the root consonants constitute a distinct entity separate from the vocalism can the mutual dependency relationship between 'k', 't' and 'b' be expressed both in the word given above, and in the semantically related words below:

k i t a a b	'book'
k i t a a b a	'writing'

m a k t a b	'office'
k a a t i b	'clerk/writer'
k a t t a b	'to make write'
k a a t a b	'to correspond'

He notes that:

> 'Every property of the source is ignored in the formation of the derived binyan . . . Formally this means that whatever sort of rule relates a derived verb to its source, that rule will have to be able to isolate the root from the vowel quality and the canonical distribution of Cs and Vs.' (McCarthy 1981:379)

McCarthy's model for nonconcatenative morphology comprises a minimum of three morphemic entities: the prosodic (CV) template which reveals the canonical shape of the word, the vocalic melody, and the consonantal melody. Elements from the vocalic melody associate with V slots of the morphological template from left-to-right; consonantal elements associate from left-to-right with C slots of the morphological template. Association applies in accordance with the UACs as above (0.4.1.1.2.1.) with the added stipulation that many-to-one association of elements of consonantal or vocalic melodies to slots on the prosodic template are prohibited (cf. McCarthy 1982:195).

0.4.1.2.1. Why morphemes on tiers?

McCarthy provides four specific reasons for analysing morphemes on separate tiers rather than analysing morphemes as linearly strung units:

a) Firstly, nonconcatenative, or tier morphology provides a plausible evaluation measure for reference to morphological information in phonological rules - i.e. rules which make reference to specific morphological features, such as [first singular] or [feminine singular], or rules which refer to a certain type of morpheme, and not to the phonological elements per se. Boundary theories say that rules can refer to boundaries at no greater cost than to segments and, thus, allow no distinction to be made between the value of segments which constitute morphemes and segments which constitute phonemes within particular morphemes. By adopting μ notation, it is possible to refer to a particular segment in a particular morpheme only by the representation:

$$\begin{array}{c} \mu \\ | \\ [\text{segment}] \end{array}$$

as in the Classical Arabic form <u>katabtu</u> 'I wrote':

$$\begin{array}{ll} \qquad\quad\;\; \mu & \text{[first sg.]} \\ \text{k a t a b t u} & \text{'I wrote'} \end{array}$$

and thus, a rule which requires this degree of morphological detail is more costly than a rule which depends solely on the information, [segment].

b) Secondly, certain hypothetical cases display potential ambiguity in boundary solutions. If, for example, a certain phonological sequence is said to be deleted in environment 'X', as below:

$S_iS_{ii}S_{iii}$ is deleted in environment 'X'.

then when two (or three) morphemes creates this sequence, the sequences:

$+ S_i + S_{ii}S_{iii}+$ and $+ S_i + S_{ii} + S_{iii} +$

will be subject to deletion as well.

μ notation eliminates the need for ad hoc conventions of interpreting '+' as in SPE - for, although '+' is a symbol in a segmental string (cf. Chomsky and Halle 1968:64, 66 etc.), it will be transparent to phonological rules unless those rules make specific mention to it. Explicit reference to μ in a phonological rule will limit the application of that rule to a specific morpheme. If μ is not specifically mentioned, on the other hand, the rule will apply without the morphological condition.

c) Thirdly, certain rules of assimilation are restricted to the environment of a specific morpheme. In Classical Arabic, Modern Standard Arabic and in modern dialects of Arabic, an initial high glide (/w/ or /j/) in the consonantal root assimilates progressively and totally to /t/ of the [reflexive] verbal infix (cf. McCarthy 1985:227, Wright 1971:80), viz:

	k a t a b	--->	(? i) [k] t a t a b	'to copy'
	ʃ a gh a l	--->	(? i) [ʃ] t a gh a l	'to work'
but:	w a S a l	--->	(? i) [t t] a S a l	'to connect'
	j a s a r	--->	(? i) [t t] a s a r	'to play at hazard'

The rule may be expressed as:

$$[w/j] \longrightarrow t / \_\_\_ \underset{\mu}{\overset{}{t}} \quad \text{[reflexive]}$$

Neither /w/ nor /j/ assimilate to a contiguous /t/ when /t/ is tauto-morphemic with the glide, viz:

w a t a d	'peg'	? a [w t] a a d	'pegs'
j a t i m	'he was weary'	j a [j t] a m	'he is weary/jaded'

d) And finally, in terms of morpheme structure constraints, in view of a constraint preventing adjacent identical or homorganic segments, tier morphology provides a plausible explanation of, for example, why no Arabic root contains both the voiced and the voiceless pharyngeal glides, /^{C}/ and /H/ (Greenberg 1950). Similarly, sibilants are constrained in their co-occurrence within the root, so that no root such as /ʃ-t-s/ is found (cf. Greenberg 1950). No such constraint, however, applies to consonants which do not cooccur within the same root. Morpheme structure constraints will refer to the root specifically, despite the fact that the root constitutes a discontinuous morpheme. Morpheme structure constraints are seen to affect, not only the consonantism, but also the vocalism. McCarthy notes that no Arabic word has the vocalism 'i-u', nor does any (Classical) Arabic verb melody begin with 'i' (McCarthy 1985:230).

0.4.1.2.2. The morphological template:

As noted above, the McCarthy model comprises a minimum of three morphemic units: the vocalic melody, the consonantal melody and the prosodic template (henceforth, the 'morphological template'). While McCarthy has, until recently, continued to depict the morphological template as a string of Cs and Vs, Levin (1983) has argued that the specification of core segments is unnecessary. Problems connected with the CV template have also been examined in Kaye and Lowenstamm (1981) and Archangeli (1984a). Most particularly, the CV template complicates processes of syllabicisation of consonants, as in the formation of syllabic nasals and laterals, and desyllabicisation of vowels, as in the formation of glides. The CV template can only show that C becomes V or V becomes C, viz:

C ---> V or V ---> C

In this latter case, an element which surfaces as V [+syllabic] normally, surfaces as C [-syllabic], or vice versa. With the CV template, an additional rule or mechanism is required to change [a syllabic] to [-a syllabic]. Levin replaces the CV template by a skeletal template which comprises a sequence of 'X' timing slots. Levin argues that while some languages have unsyllabified morphemes underlyingly and syllabification procedures operated on strings which are essentially of the type:

```
X X X X
| | | |
s o k s
```

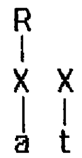
by computing the relative sonorities of s:o and o:k and k:s, other languages, such as Arabic (and including the Yemeni dialects investigated here), have partially syllabified morphemes. The interpretation of segments as either Cs or Vs is predictable in the first case, but the distribution of Vs in morphological templates is not predictable in the second case. A sequence of undifferentiated X slots on the template may therefore not be sufficient for languages which fall into the latter category (Levin 1983:22). In the present model, skeletal morphological templates are postulated to which rhymes are already attached, as in:

```
  R   R
  |   |
X X X X X
```

In the earlier McCarthy model, elements from the vocalic melody associate with V slots and elements from the consonantal melody associate with C slots. In order to determine the linking of feature matrices to morphological templates in this model, the prosodic label 'R' is used (Levin 1983). Vowels (i.e. elements from the vocalic plane) associate with any 'X' slot dominated by a rhyme-head, while consonants associate with all other 'X' slots. Using the skeletal 'X' template a long vowel can be represented unambiguously as two X slots linked to a single syllable nucleus, viz:

```
R
|\
X X
 \/
 a
```

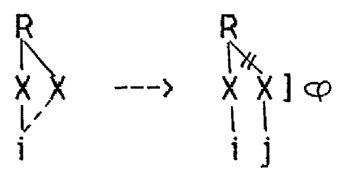
And this distinguishes a long vowel from a vowel-consonant sequence:



The skeletal 'X' template illustrates processes of glide formation far more economically than the CV template. Consider the following instance of utterance-final glide formation (Identity Diphthongisation, cf. 2.1.2.) which will be seen to occur in the Yemeni dialects examined in this thesis:

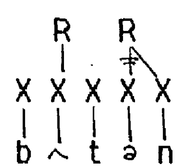
b i n t i i]φ ---> b i n t i [j]]φ 'my daughter'

In this case, the final element of the long vowel can be said to have been subject to utterance-final desyllabicisation, which is diagrammed as below:



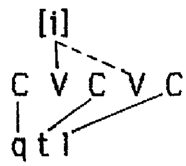
The skeletal 'X' template also proves useful in illustrating processes of syllabicisation of underlying (sonorant) consonants, as [n̩] in the English word <u>button</u> which may be pronounced as [bʌt n̩] 'button'

The syllabicisation of a consonant can be represented as below:

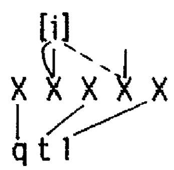


In this case, the X slot associated with the vowel is disassociated and 'n', which belongs to the rhyme after syllabification, is realised as syllabic. Note that while arguments have been forwarded here for the use of the 'X' template as opposed to the CV template of McCarthy (1981, 1982, 1985,

1986) and Clements and Keyser (1983), for simplicity of representation when depicting timing slots to which features have been associated, CV will be used for expository convenience (and cf. Pulleyblank 1988), as in the associated representation of (Hubaiʃi) /qitil/ 'he was killed':



This represention circumvents the (purely graphological) problem of feature association lines conflicting with rhyme-heads, viz:



0.4.1.3. Lexical phonology:

Following Cole (1987) and McCarthy (1986), it is assumed that every morpheme in a word is represented on a distinct tier and that new tiers are created only as a result of morphological affixation. A natural advance from McCarthy's treatment of nonconcatenative morphology is the folding of the latter into the basic tenets of lexical phonology.

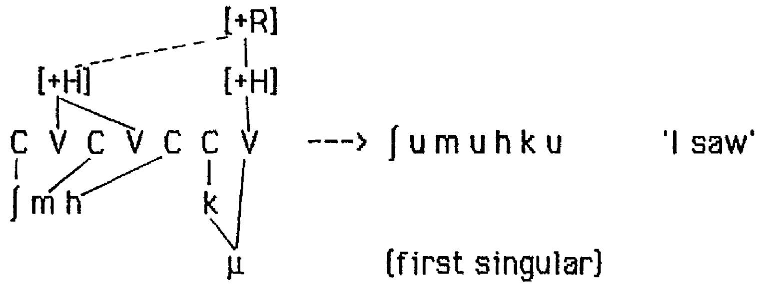
In lexical phonology, two fundamentally different levels of phonology are acknowledged in which phonological rules may operate: a lexical component in which phonological rules sensitive to morphological structure operate; and a post-lexical component in which phonological rules are insensitive to morphological information and act purely on phonological representations. Since the appearance of Chomsky and Halle's The Sound Pattern of English (1968) (hereafter SPE) the formal characterisations of the relationships between phonological and morphological processes have undergone radical change. In SPE morphemes comprise sequences of segments which may concatentate with one another, like beads in a string, and then undergo phonological rules as a group. Concatenated morphemes are separated by boundaries of varying strength, '+', '*', and '**', and phonological rules may make reference to these boundaries (Chomsky and Halle 1968:364ff.). By enabling reference to be made to these boundaries a rule may apply to a certain affix, but be excluded from other affixes. Some rules, however, are seen to apply to the phonological representation irrespective of morphological information (cf. Chomsky and Halle 1968:60). Lexical phonology and morphology developed with Kiparsky (1982a, 1984), Halle and Mohanan (1983), Pulleyblank (1986) and others as a generative theory which pairs morphological and phonological processes and postulates a set of distinct properties for rules that make reference to morphological information - i.e. phonological rules which, in SPE, make reference to boundaries between morphemes. Rules which make reference to morphological information are said to apply in the lexicon (lexical rules), while rules which do not require morphological information are said to apply outside the lexicon (post-lexical rules). I shall summarise the major differences between lexical and post-lexical rules briefly below:

1) Post-lexical rules can apply between words as well as within words. Lexical rules, on the other hand, apply solely within words. A typical post-lexical rule is Flapping in North American English, illustrated below as it applies within the word, (a)), and across words, (b)):

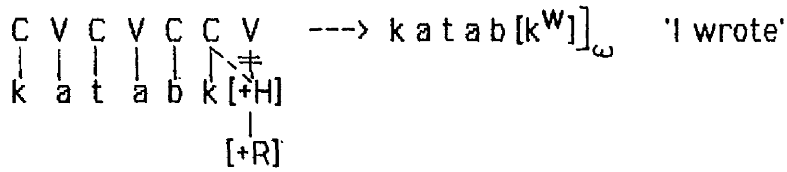
a) si[D]ing 'sitting'
b) si[D] in the park 'sit in the park'

2) Post-lexical rules are not subject to lexical exceptions, but lexical

rules may be. An example of a lexical rule is (first singular) [+round] spread in Hubaiʃi (one of the dialects studied in this thesis). In this case, the feature [+round] spreads from the (first singular) inflectional suffix, and only from the (first singular) inflectional suffix, onto [+high] vowels of the perfective verbal stem, viz:



In Kusmi, the feature matrix of a final [+palatal] or [+round] vowel is disassociated in phonological word-final position and spreads onto the slot of the contiguous palatalisable or roundable consonant (thereby entering into complex consonant formation, cf. 0.4.1.5.3.4.). This is an instance of a post-lexical rule which has no lexical exceptions, for example:



3) Post-lexical rules, but not lexical rules, can create 'novel' sequences, structures and segments. In the example given in 2) above (<u>katab[k^{W}]</u> 'I wrote'), [k^{W}], which is not a phoneme of the language, has been created by post-lexical rule. Similarly, in utterance-final position in all three of the Yemeni dialects examined in this thesis, a post-lexical process of utterance-final glottalisation produces devoiced [b̥], [n̥], [l̥], [m̥], etc. as well as glottalised [k'] and, in some cases, glottalised [t'], none of which are phonemes of the language, viz:

a) q a a t $]_{\varphi}$---> q a a [t']]$_{\varphi}$ 'qāt' (catha edulus)

b) ? a b S a r k $]_{\varphi}$---> ? a b S a r [k']]$_{\varphi}$ 'you m.s. saw' (Hub.)

c) b a a b $]_{\varphi}$---> b a a ? [b̥]]$_{\varphi}$ 'door'

4) Lexical rules, but not post-lexical rules, are subject to the Strict Cycle Condition (Kiparsky 1982a:154, Archangeli 1984a:26, Kaisse and Shaw 1985:6, Mascaro 1976, in Archangeli 1984b:6-7). This reads:

0.4.1.3.1. Strict Cycle Condition:

a) Cyclic rules apply only to derived representations

b) A representation 0 is derived with respect to rule R in cycle j iff 0 meets the structural analysis of R by virtue of a combination of morphemes introduced in cycle j or the application of a phonological rule in cycle j (Kiparsky 1982a:154)

This condition restricts rules which render input and output distinct from applying in underived environments, where derived environments are those environments created by a morphological or phonological process (Archangeli 1984b:7). The lexical rule of trisyllabic laxing will therefore apply in the case of sanity, since sanity comprises the affix -ity and the word sane. It will not, however, apply to the trisyllabic words nightingale and ivory since neither of these latter words are derived, both are primitive (Kaisse and Shaw 1985:21 and 26). North American English Flapping, however, as a post-lexical rule, is not subject to the Strict Cycle Condition, and therefore does apply to nightingale (and cf. Kaisse and Shaw 1985:6).

5) Finally, in lexical phonology the lexicon comprises a number of lexical strata, each stratum being a pairing between a set of morphological processes and a set of phonological rules, viz:

STRATUM morphological processes	phonological rules rule 1 rule 2 etc.

(Archangeli 1984b:2).

Certain lexical rules are restricted in application to a certain stratum and are prevented from applying at different strata. An instance of the consequences of restricting application to a certain stratum will be observed below. Since no word-internal information is available post-lexically, there is only a single post-lexical stratum.

Today there is some dispute regarding the number of strata (henceforth, levels) in the lexicon. In this thesis I do not enter into this dispute. For the purpose of the present model for dialects of Yemeni Arabic three lexical levels are observed, viz:

	morphology	phonology
level 1	inflection	[+R] spread (Hub./Kus.), [+H] spread (Hub.), syllabification, etc.
level 2	object suffixation	[+R] spread (Kus), pre-suffix lengthening, syllabification, etc.
level 3	negation	pre-suffix lengthening, syllabification, etc.
	Post-lexical level	stress, syllabification, remaining redundancy rules

Note that the 'level 1' which I have established for the analysis of the Yemeni dialects considered in this thesis is not the level 1 in the general terminology of lexical phonology since the latter is earlier than the level of inflectional morphology. Since my concern begins at the morphological level where subject agreement inflections are added, however, it is the inflectional level which I am defining here as level 1. There is at least one level - such as the derivational level - before level 1, and which would be analysed here as 'level o'.

0.4.1.3.2. Bracket erasure:

Lexical phonology, as applied to concatenative morphological systems, relies heavily on the bracketing of word-internal morphemes within the lexical component. Bracketing takes the place of traditional phonological boundaries, '+', '*' and '**', and serves to eliminate many of the problems associated with boundary symbols (cf. Kiparsky 1982b, Kaisse and Shaw 1985:2). Within the lexical component, requisite information is then carried by the appropriate ordering of levels and the morphological bracketing of the string (Kiparsky 1982b:11). The Bracket Erasure Convention states that at the end of each cycle within the lexicon bracket erasure is applied to remove morphological information, viz:

0.4.1.3.2.1. The Bracket Erasure Convention:

Internal brackets are erased at the end of each cycle (Kiparsky 1982a:140, Archangeli 1984b:4, Kaisse and Shaw 1985:9).

This means that morphological information available to one level is inaccessible to the next (higher) level. For example, in English -ity is affixed at level 1, and so at level 1 the word is a noun and un-, which is only affixed to an adjective, may not be attached, viz:

	$[\text{able}]_A$	$[\text{able}]_A$	$[\text{equal}]_A$	$[\text{equal}]_A$
level 1	$[\text{ability}]_N$	---	$[\text{equality}]_N$	---
level 2	---	$[\text{unable}]_A$	---	$[\text{unequal}]_A$
	* $[\text{unability}]_N$		* $[\text{unequality}]_N$	

However, if the BEC did not hold at level 2, then [ability] and [equality] would have the following structures:

$[[\text{abil}]_A\text{ity}]_N$ $[[\text{equal}]_A\text{ity}]_N$

and presumably, since the information 'A' (adjective) is still available, <u>un-</u> could concatenate to the adjective to produce the unattested forms:

*[unability] *[unequality] (cf. Archangeli 1984b:4)

At the end of the lexical component all morphological bracketing is removed and the resulting phonological representation enters the post-lexical component. In the post-lexical component, phonological rules operate purely on the phonological representation and have no access to morphological information.

0.4.1.3.3. Tier conflation:

While morphological bracketing works in concatenative morphological systems, in nonconcatenative morphological systems, the bracketing convention is untenable. As seen in the Classical Arabic example <u>kataba</u> 'he wrote' above (repeated below for convenience), any attempt (by means of either boundary symbols or brackets) to divide a word into a string of concatenated morphemes fails:

[k] [a] [t] [a] [b] [a] 'he wrote'

There are six unrelated segments, none of which (bar, as seen above, [a] of the third instance) has morpheme status. A solution is found by following McCarthy (1986), in proposing that the presence of morphological tiers eliminates the need for labelled brackets. In place of bracket erasure, a process of tier conflation is proposed, and therefore no phonological word-internal boundary symbols or brackets will be used in rules. Uniplanar representations are derived from multiplanar representations by a process which McCarthy terms tier conflation and Cole terms plane conflation (Cole 1987:ii). McCarthy equates tier conflation with bracket erasure, assuming that the latter may apply more than once in the lexical component and demonstrating (in the case of Tiberian Hebrew) that tier conflation may do likewise. Cole, on the other hand, by arguing that bracket erasure is limited to a single application and conceding that, in some cases, plane conflation can apply internal to the word-level derivation claims that the two processes may not be correlated so simply (Cole 1987:175ff.).

As far as the account of the data here is concerned, what I shall term tier conflation is limited to a single application which applies as items exit from the lexical component. I shall leave open the question as to whether tier conflation may apply at different levels in these dialects. The only brackets invoked are word-level brackets inserted after the lexical component and brackets to indicate utterance-finality/initiality inserted towards the end of the post-lexical component. Consider the form <u>katabat</u> 'she wrote' in phonological word-final and utterance-final positions in Kusmi and Gabiini:

Phonological word-final:

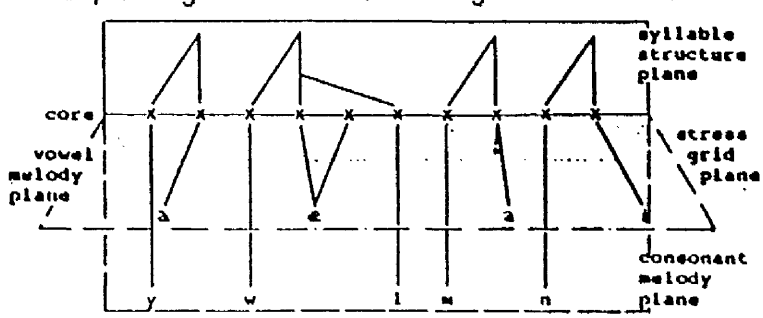
k a t a b a t$]_{W}$ 'she wrote'

Utterance-final:

k a t a b a t]$\mathcal{Q}$ 'she wrote'

0.4.1.4. Underspecification:

A further significant advance in phonological theory is that of underspecification theory. The central goal of underspecification theory is to eliminate all redundancy from underlying representations (Kiparsky 1982b, Archangeli 1984a:11, Pulleyblank 1988:236). This theory first gained recognised credence with the publication of Pulleyblank's doctoral dissertation, Tone in Lexical Phonology (1983, published 1986), and, perhaps more importantly, with the appearance of Archangeli's doctoral dissertation, Underspecification in Yawelmani Phonology and Morphology (1984). The ground had been prepared for the theory, however, since generative phonology has long aspired to eliminate redundancy in phonological representations. Underspecification theory represents an elaboration of certain key phonological concepts of the Prague School: the concepts of the archiphoneme, neutralisation and markedness. As the name suggests, underspecification operates on the premise that the smallest number of specifications possible are available in lexical representations in order that 'the language-learner has less to learn and less to memorize' (Archangeli 1984a:42). Underspecification applies to all aspects of the representation including syllable structure and stress assignment; it is not limited to phonological features (Archangeli 1984a:12). As for autosegmental phonology, the lexical representation comprises several interrelated components: the core skeleton, consonantal and vocalic melodies, structures and the relationship between melodies and structures and the core skeleton. The surface representation of Yawelmani 'tribal name-pl.' is given below (Archangeli 1984a:13).



0.4.1.4.1. Feature specification of phonemes:

Only those features which are necessary to distinguish between two phonemes are present in the underspecified lexical representation. This parsimony is achieved by:

a) employing the smallest set of distinctive features necessary to render phonemes distinct;

b) extracting all possible redundancies from feature specifications.

The number of distinctive features is subject to the Feature Minimization Principle, viz:

0.4.1.4.1.1. Feature Minimization Principle:

> A grammar is most highly valued when the underlying representation includes the minimal number of features necessary to make different the phonemes of the language. (Archangeli 1984a:50)

Distinctive features are reduced to a minimum by employing the following definition for 'distinctiveness':

> 'A feature F is distinctive if and only if it serves to distinguish two sounds of a language.' (Archangeli 1984a:43)

All features which are non-distinctive for a language are unspecified in the lexical representation of the phonemes of that language. In view of this, there can be no feature such that some value is specified for that feature in every phoneme (Archangeli 1984a:39), since identical specification of a feature 'F' for every phoneme would render 'F' non-distinctive. This means that the following specifications are ill-formed. 'F' in both cases is non-distinctive:

*	a	b	c
F	+	+	+

*	a	b	c
F	–	–	–

A feature 'F' is also considered non-distinctive if it can be supplied predictably by rule elsewhere. Thus, for example, the feature [syllabic] is redundant because the value for [syllabic] in a given segment is correlated to the syllable structure dominating that segment (Archangeli 1984a:164, Pulleyblank 1988:240). Since one of the conditions on syllable structure is that:

> 'a [+syll] element must be immediately dominated by R (Rime) and R must immediately dominate a [+syll] element at every level.' (Levin 1983:13)

given the structure $\begin{array}{c}R\\|\\X\end{array}$, $\begin{array}{c}|\\X\end{array}$ is syllabic by definition. Therefore, the feature [syllabic] is non-distinctive and must be dispensed with in an approach which calls for minimal redundancy.

0.4.1.4.2. The marked feature-value:

In order to extract all possible redundancies from feature specifications, only one feature-value is selected for a given feature in all lexical representations for a given language (Kiparsky 1982b:54, Archangeli 1984a:39). Both values cannot be represented underlyingly for any given feature, therefore the following matrix is ill-formed, viz:

*	a	b	c
F	+	+	–

The marked feature-value selected for a given feature is determined by language specific factors in addition to universal considerations of markedness.

The notion of positing either '+' or '-' for a feature in a given representation has led to a revival of objections based on Stanley's (1967) arguments that such a theory may be embarking on a three value system: '+', or '-', or 'nothing at all', where 'nothing at all' may be either '+' or '-'. While I believe this argument is countered effectively by stipulating that no feature can be marked both '+' and '-' in the same environment in the lexical representation (Kiparsky 1982b:54, Archangeli 1984a:42), and by the mode of operation of redundancy rules (explained below, cf. 0.4.1.4.4.), the objection may be countered still further, not by selecting one of two values for each feature, but rather, by selecting one and the same value for every feature in the lexical representation - namely '+'.[1] Firstly, the status of [-F] is highly ambiguous - for it may mean that the feature is entirely lacking, or it may mean that the feature is non-distinctive for a particular phoneme, or, conversely, it may (also) mean that a phoneme has the least possible degree of that feature, or it may (also) mean that a phoneme simply does not have enough of the feature to warrant its labelling [+F]. And, secondly, valid arguments have been raised in favour of spreading only [+F], since spread of the absence of a feature, or spread of a negative feature(-value) is difficult to conceptualise. It must be the feature which spreads and not <u>absence</u> of the feature. Clements states:

> 'while nonlabials become labials in the neighbourhood of labials, we do not typically find delabialisation processes defined on the class of nonlabial segments; and similarly, assimilatory nasalisation processes are much more frequent

1. Note that Archangeli actually uses only '+' in specifications in the underspecified consonantal matrix (Archangeli 1984a:107) though she attaches no theoretical significance to this.

than assimilatory denasalisation processes.' (Clements 1976:106)

At certain stages in this thesis, this position has led me to review those features which are distinctive such that they do trigger spread: it is proposed, for example, that palatalisation processes are induced, for example, not by the spread of [-back], but rather by the spread of [+palatal]. Where [-F] is inserted by redundancy rule, '-' indicates lack of distinctiveness in the broadest possible sense - that is to say, a laryngeal /h/, which can be produced with any body of tongue configuration, is assigned the feature-values [-high] and [-low] redundantly since neither [high] nor [low] are distinctive in the articulation of this phoneme.

0.4.1.4.3. Non-specified segments:

A theory which eliminates redundancy by allowing only those features and feature-values in the lexical representation which serve to distinguish phonemes enables the lexical representation of one term in both of the major prosodic categories - namely, Cs and Vs - to have no feature specifications whatsoever. Just as distinctive feature-values and the relevant distinctive features themselves are determined on the basis of the facts of the phonology of the language, so determination of such a 'maximally unspecified segment' (MUS) - Archangeli's term (1984a) - which I refer to henceforth as a 'non-specified segment' (NSS) (Hayward and Watson, to appear) - is language specific. Where, traditionally, it would be said that the identity of the minimal vowel were, for example, /a/, in underspecification it is said that the non-specified vowel (NSV) is underlyingly <u>nothing</u> but has a <u>default</u> realisation of [a] - that is to say, if 'a' is the NSV, and no rule spreads features from an adjacent segment, then the NSV will be realised as [a] following the application of all redundancy rules. Archangeli says of the maximally unspecified vowel (our NSV):

> 'A vowel whose sole rationale for existence is consideration of syllable structure ought to exhibit no feature-specifications other than those supplied redundantly.' (Archangeli 1984a:249)

The NSS will be that consonant which acts asymmetrically within the consonantal system ('non-specified consonant' NSC), or that vowel which acts asymmetrically within the vocalic system (NSV) precisely because other segments do possess underlying specification and this segment does not (Pulleyblank 1988:240). Asymmetric characteristics of such a segment include: frequency of occurrence, epenthetic function to make up for deficiencies in the prosodic structure; manifestation as a non-harmonic segment in a harmony process - it is likely to be the target, but not the trigger of assimilation; propensity to deletion; and a wide and frequent morphological function.

It follows from these characteristics that non-specification can occur in both the lexical and the post-lexical components: frequency of occurrence is both a lexical and a post-lexical phenomenon; prosodic function to make up for deficiencies in the syllable structure, in general (but not exclusively), is post-lexical; non-harmony in a harmony process may be both lexical and post-lexical; morphological function is exclusively lexical. Since the characteristics of the NSS are not identical in the post-lexical and the lexical components, in either of the two major classes in the prosodic system - Cs and Vs - it is possible for the default realisation of the lexical NSS to differ from the default realisation of the post-lexical NSS. In Hayward and Watson (to appear) it is demonstrated that the post-lexical NSV in Amharic does not have the same default realisation as the lexical NSV. In the same article, and in this thesis, it is shown that while the NSV in the Yemeni dialects examined here does have the same realisation at both the lexical and the post-lexical levels, the NSC does not: the glottal stop, which is the default realisation of the prosodic NSC, lacks frequency in the lexical component and does not enjoy as much morphological function as /t/ which I hold to be non-specified in the lexical component.

In Hayward and Watson (to appear) it is concluded, as in the present case, that where there is a disjunction between the lexical and the post-lexical NSSs, the post-lexical NSS chosen will generally be that with a low frequency of occurrence in the lexical component.

0.4.1.4.4. Redundancy rules:

Feature-values left blank in the lexical representation are supplied by redundancy rules (Archangeli 1984a:43). Redundancy rules insert predictable feature-values, but are not permitted to change lexically specified feature-values (Archangeli 1984a:46, Kiparsky 1982b:55). To ensure that this follows, all redundancy rules are subject to the Distinctness Condition, as below:

The Distinctness Condition:

> The input to a redundancy rule is not rendered distinct from the output by application of the redundancy rule. (Archangeli 1984a:46)

0.4.1.4.4.1. Ordering of redundancy rules:

In traditional generative phonology, all predictable (redundant) feature specifications omitted from the lexical representation were supplied simultaneously and prior to the operation of any phonological rules, so that the matrices of all segments were complete at the beginning of the 'phonological component' (cf. Chomsky and Halle 1968:386ff.). In underspecification, it is recognised that the absence of feature-values can be exploited if and only if redundant feature specifications are inserted after at least some phonological rules have applied. Redundancy rules are withheld from applying, therefore, for as long as possible. In order to prevent a phonological rule referring to [aF] applying before values for [F] have been inserted, the Redundancy Rule Ordering Constraint is adopted, as below:

0.4.1.4.4.1.1. Redundancy Rule Ordering Constraint:

> A redundancy rule assigning 'a' to F, where 'a' is '+' or '-' is automatically ordered prior to the first rule referring to [aF] in the structural description. (Archangeli 1984a:85)

This means that redundancy rules are withheld until immediately prior to the application of a phonological rule which would need to refer to an otherwise absent feature-value. The most significant result of this stand is that segments may acquire feature content by means of phonological rules and can only be said to receive their content redundantly in the default case. This position effectively eliminates the need of phonological feature-changing rules (as used in Chomsky and Halle 1968:239 etc., and cf. Brown 1972). Since redundancy rules are withheld for as long as possible, it is assumed in the present case that redundancy rules operate in the post-lexical component as far as possible - that is to say, where they are not required to operate in the lexical component by the Redundancy Rule Ordering Constraint.

0.4.1.4.4.2. Types of redundancy rules:

The theory recognises three types of redundancy rules:

a) Default rules;

b) Complement rules;

c) Learned rules. (Archangeli 1984a:45)

The first two of these rule types are cost-free, the third type is not cost-free. The first rule type is similar to the universal marking conventions (Chomsky and Halle 1968:403ff.), the latter two are language particular. While the decision to mark certain features depends on an interpretation of the phonology of the language, the form and operation of these redundancy rules is considered part of Universal Grammar. Redundancy rules take the form:

R.R. [ ] ----> [aF]/x___y where 'a' is the unmarked value for 'F' and 'F' is a feature (Archangeli 1984a:46, Kiparsky 1982b:54)

Default rules comprise a set of context-sensitive rules and take the form:

D.R. [ ] ----> [aF]/[___,bG]

as in the default rule assigning [+high] to a [+round] segment, viz:

D.R. [ ] ----> [+H]/[___,+R]

This rule does not prohibit the existence of segments which are round but not high, but it does state that this is what will obtain in default of a phonological rule or a language-particular learned rule supplying such a feature combination.

Complement rules, as the name suggests, provide the complementary value to that value selected for marking in the lexical representation. Given that all features present in the lexical representation are marked [+F] in this model, any complement rule appears as:

C.R. [ ] ---> [-F]

Feature-values which would remain unfilled following the application of default and complement rules are dealt with by the third type of redundancy rule - language-particular learned rules.

Note that certain phonologically redundant specifications are never supplied in the phonology since they are absent even in the input to phonetic implementation. As Keating argues, simple consonants without secondary articulations are not assigned default values for secondary features (Keating 1985, cited in Pulleyblank 1988:236).

> 'The phonologically underspecified representation receives full phonetic interpretation via rules that interpolate from specified values without going through any stage where all segments are fully specified.' (Pulleyblank 1988:236)

0.4.1.5. Feature geometry:

Underspecification has proved to be a milestone in phonological theory; however, only in conjunction with the advent of feature geometry is it able to explicate several otherwise unexplained happenings. One of these is why, given a certain number of vocalic or consonantal phonemes, one of these phonemes is universally more likely to be the NSS in the system. As with McCarthy's treatment of nonconcatenative morphology, feature geometry emerges as a natural consequence of the findings of autosegmental phonology. Phonemes are traditionally held to be unordered 'bundles', 'lumps' or 'complexes' of distinctive features (Bloomfield 1933:79, Chomsky and Halle 1968:335ff.). Lass describes the phoneme inventory as a 'set of bundles of feature specifications' (Lass 1984:94). McCarthy, until recently, similarly considered autosegments to be 'bundles of distinctive features' (McCarthy 1985:230, however, cf. McCarthy 1989). In feature geometry, it is demonstrated that phonemes are not unordered bundles of features, but rather comprise hierarchically-ordered features displayed on distinct but interlinked planes (Clements 1985, Sagey 1986, Schein and Steriade 1986, Cole 1987, Pulleyblank 1988, McCarthy 1989). Feature geometry represents both the separate and the coordinated aspects of features within a hierarchical structure.

0.4.1.5.1. Hierarchical ordering of distinctive features:

Clements introduces the hierarchical representation of separate yet coordinated features formally. Under his proposal of feature geometry, 'a phoneme is taken to be the timing unit together with all the distinctive features which are linked to it' (Clements 1985:17). These distinctive features are ordered hierarchically on a planar model comprising a number of articulatory parameters, each of which shows a high degree of independence from the others. These are:

a) laryngeal configuration;

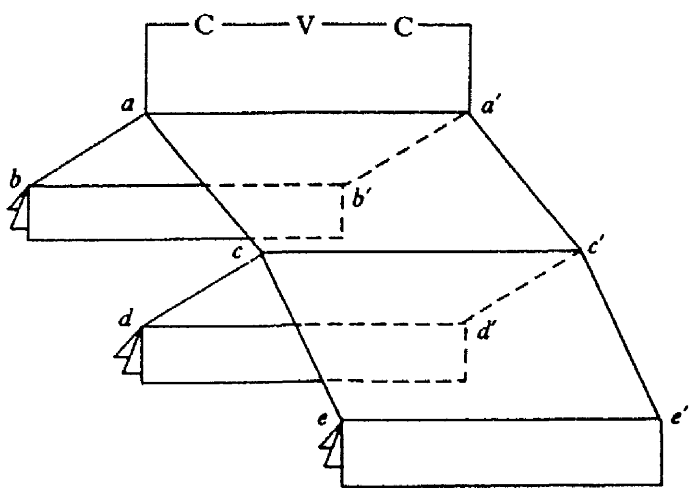
b) degree of nasal cavity stricture (open/closed);

c) degree and type of oral cavity stricture;

d) a pairing of an active and a passive articulator.

The various categories above are not equally independent of each other. The laryngeal configuration is freely variable with respect to the other three categories while the latter three demonstrate varying degrees of mutual independence. The various dependency relations between any distinctive features can be expressed by hierarchical grouping such that higher branching categories tend to be more independent than lower branching categories.

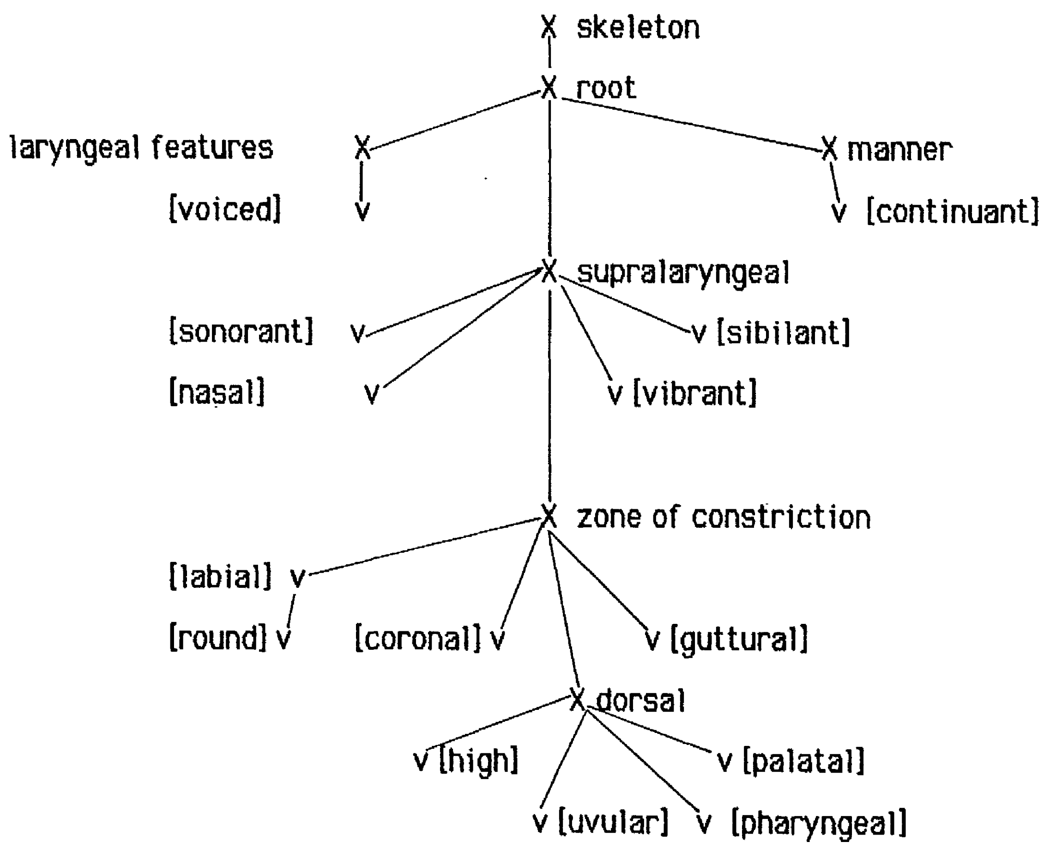
Clements' planar model:



aa' = root tier, *bb'* = laryngeal tier, *cc'* = supralaryngeal tier, *dd'* = manner tier, *ee'* = place tier

The model I propose to use in this thesis is drawn up on the lines of that put forward by Cole (1987) and Pulleyblank (1988) where segments are represented on partially specified trees. One of the advantages of the tree model over the planar model is that the former demonstrates how features on terminal nodes at the lower end of the tree are dependent on the presence of all non-terminal nodes to which they are directly linked upto and including the root node. It is assumed that all articulator nodes and all terminal nodes constitute monovalent features. In this way the presence of a nasal node indicates what would have been interpreted in a binary system as [+nasal] (and cf. Pulleyblank 1988:235).

In the present model, I shall follow Hayward's suggestion (p.c.) and posit a zone of constriction node instead of a place of articulation node - there are two reasons for this, firstly, 'place' implies discrete points of articulation and I shall want to include features which cover larger zones of the vocal tract, viz: [coronal], [palatal], [guttural], [dorsal]; and secondly, 'place of articulation' tends to refer to the passive articulator, and I shall want to refer to an active articulator, i.e. [dorsal], as one of the zones of constriction in this model. The feature matrix tree to be used in this model appears as below:

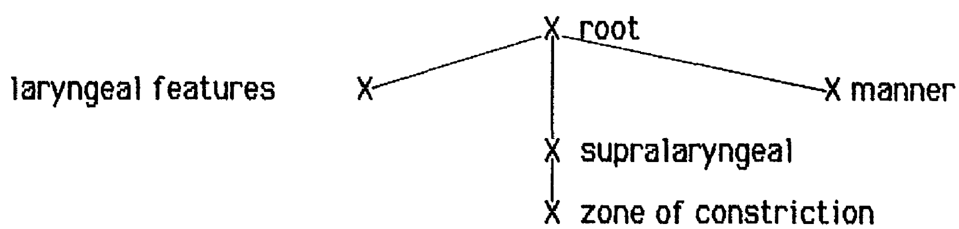


'X' denotes non-terminal feature nodes, or class nodes in this model, while 'v' denotes terminal nodes.

Note that there are a large number of feature geometry models available today which in varying degrees depart from Clements 1985 (for example, Sagey 1986, Schein and Steriade 1986, Cole 1987, Pulleyblank 1988, McCarthy 1989, Hayward p.c.). No model has proven to be entirely satisfactory and feature geometry is clearly not a decided area. The present model has been devised on the basis of problems found in the Yemeni dialects examined in this thesis and certainly does not claim to have ironed out all the short-comings of previous models.

0.4.1.5.2. The NSS:

Even segments which lack any lexical specification must have certain (non-terminal) nodes on the feature matrix tree underlyingly in order that they can be realised as segments at all. For these segments the root node is not empty (Sagey 1986, cited in McCarthy 1989:93). In this model, the NSS possesses non-terminal nodes but redundantly lacks all terminal nodes, as in:



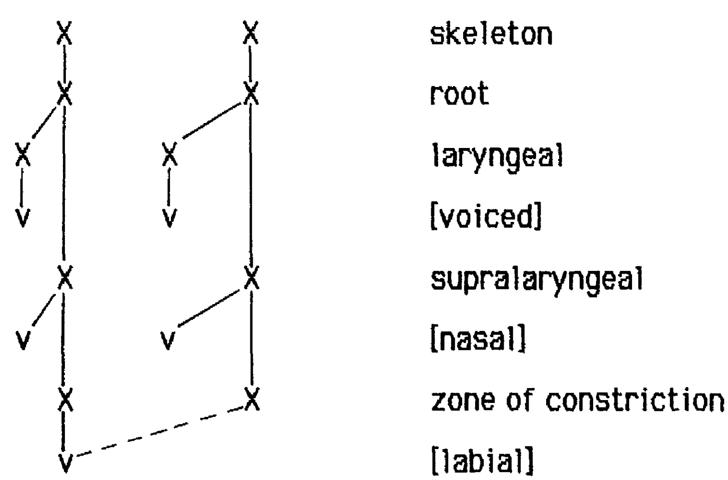
Terminal features are filled in either by default or by means of feature spread from adjacent segment(s). One of the immediate consequences of feature geometry is that it provides a nice explanatory account of why, given a certain set of phonemes in either of the two major prosodic categories (consonantal/vocalic), one particular phoneme is universally more likely to be the NSS of the system than a second. Archangeli states that in a given vocalic system containing five vowels, [a] is the anticipated default value of the maximally unspecified vowel (MUV). All else being equal, the vowels are ranked [a]<[i,u]<[e,o] (Archangeli 1984:63). Mere observation of the distinctive features involved does not, in itself, provide any adequate explanation; however, if we consider that certain tiers/branches operate separately yet in a coordinated manner, exhibiting degrees of mutual independence, the reason becomes clearer: all segments possess a laryngeal node in which voicing is or is not present. Vocalic segments which are high are marked [+high] on the dorsal node. Vocalic segments which are high and round are marked [+round] on the labial node as well as [+high] on the dorsal node. Segments which are palatal are marked [+palatal] on the dorsal node or on the coronal node. Vocalic segments which are neither round nor palatal nor high will redundantly lack the zone nodes coronal and labial as well as terminal nodes linked to the dorsal node. Although this is not always the case, the most likely candidate for vocalic non-specification is that which will be realised by default as [a], since [a] is [+guttural] but redundantly lacks all other zone of constriction nodes. While it is attested in some languages such as Telegu (Archangeli 1984:58) and Zayse (Hayward p.c.), [u] rarely constitutes the default realisation of the NSS in the vocalic system. A view of the feature matrix tree suggests that /u/ may be marked both on the labial node and the dorsal node. In order for [u] to be the default realisation of the NSV, neither the [+high] feature on the dorsal node, nor the [+round] feature on the labial node would be distinctive in the language system. Universally, /i/ tends to be less marked than /u/, since it redundantly lacks a [+round] labial marking while it shares, with /u/, a [+high] dorsal marking.

0.4.1.5.3. Assimilation processes:

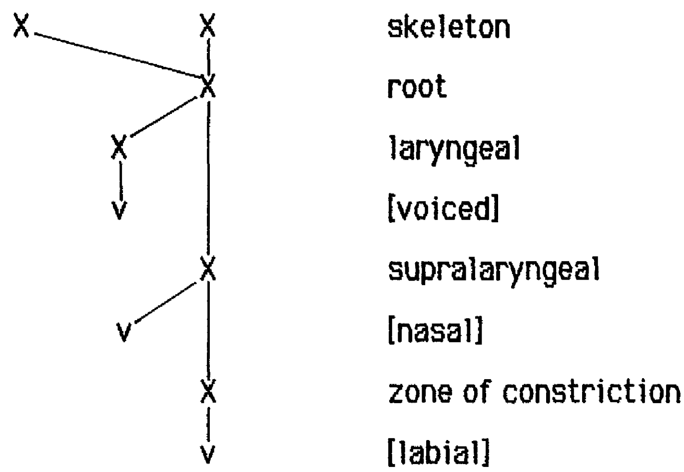
Feature geometry also provides a neat explanation of assimilation processes. Assimilation can be described as the spreading of a feature on the branch of one tree to an adjacent tree (i.e. from one phoneme to an adjacent phoneme). The separate yet coordinated activities of branches in the feature tree allow class or terminal nodes to spread independently of other class or terminal nodes. Assimilation may be either full - in which case the target segment assumes all the characteristics of the trigger segment, or partial - where the target segment assumes one or more, but not all characteristics of the trigger segment.

0.4.1.5.3.1. Total assimilation:

In the case of the former, total assimilation may occur when a segment which already shares many of the features of the trigger segment receives non-shared specification, as in the assimilation of /n/ to [m] in the environment of /m/, viz:

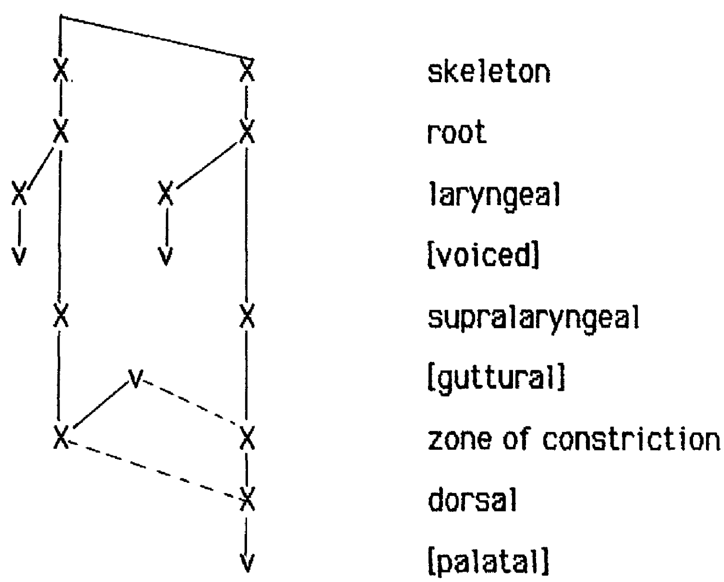


The OCP (0.4.1.1.2.2.) consequently brings about simplification to:

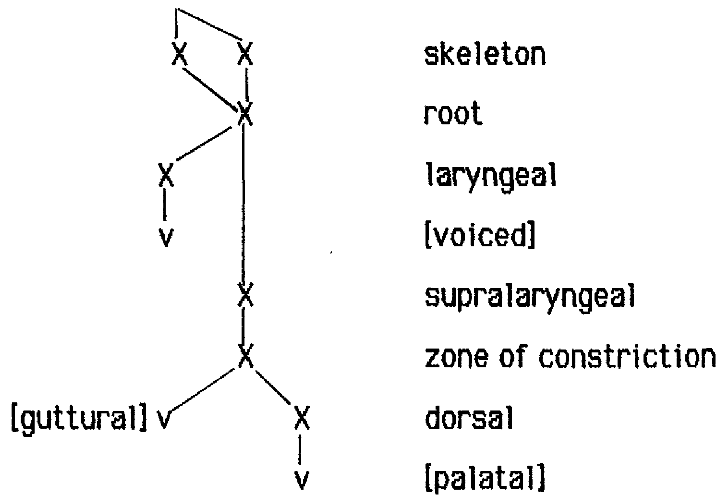


0.4.1.5.3.2. Coalesence:

Alternatively, terminal features may spread bidirectionally onto the adjacent segment, as in coalescence of /ai/ to [ee] in Kusmi and Gabiini:

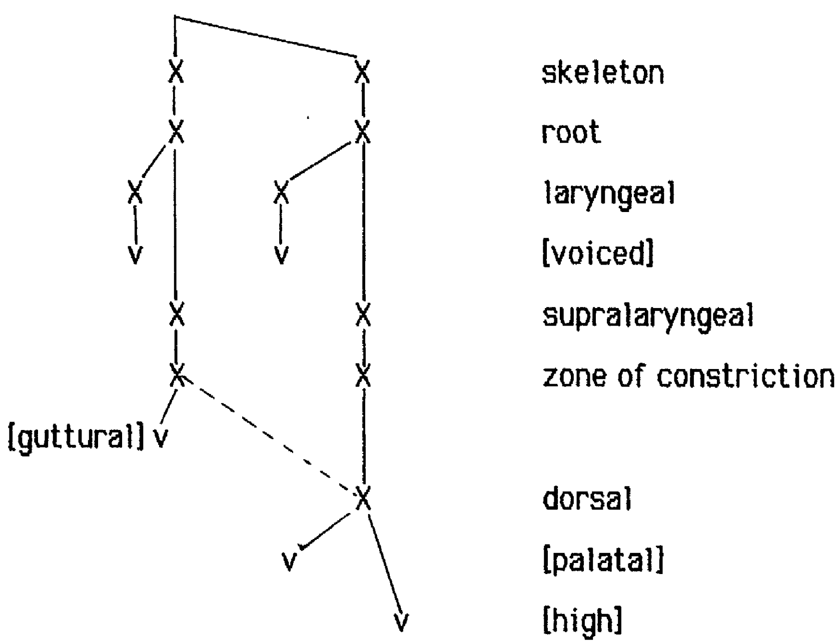


In this case, the terminal [guttural] node spreads from left-to-right while the non-terminal dorsal node spreads from right-to-left. The OCP consequently brings about simplification to:



0.4.1.5.3.3. Partial assimilation:

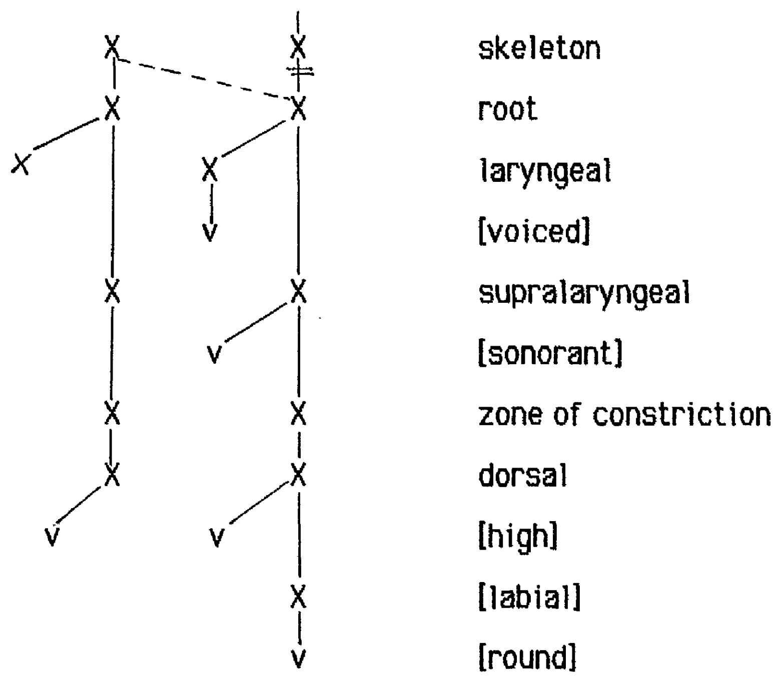
With partial assimilation, at least one node other than the root node - and it may be either class or terminal, spreads. Consider the assimilation of /a/ to [e] in the environment of /i/ in Hubaiʃi:



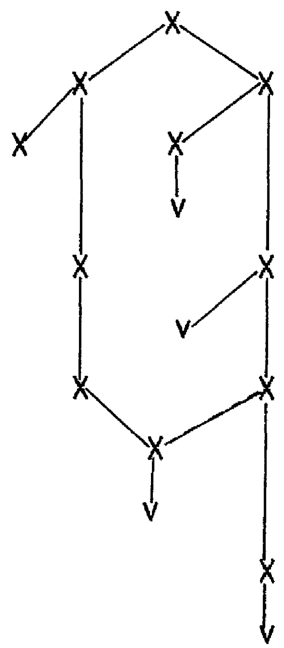
In this case, it is the dorsal node only which spreads from right-to-left. [Guttural] does not spread (from left-to-right). Segments marked [+G,+P] are realised as [e] (cf. 2.3.1.) and the output of this spread process is [ei] ([+high] is simply not distinctive in this case).

0.4.1.5.3.4. Complex consonant formation:

In total assimilation (0.4.1.5.3.1.) and coalescence (0.4.1.5.3.2.), two X slots come to be associated with a single root node together with all associated features. In complex consonant formation where a (roundable or palatalisable) consonant acquires the entire feature content of an adjacent ([+round] or [+palatal]) vowel it is suggested, albeit tentatively, that a single X slot becomes associated with two root nodes. In complex consonant formation I assume that the feature matrix of the vowel is disassociated and the (now) unassociated root node subsequently spreads from right-to-left to the skeletal slot of an adjacent consonant. I use the labialisation of /k/ to illustrate the process below:



The OCP consequently brings about simplification to:



0.4.1.5.3.5. 'Parasitic' harmony:

One type of harmony is accounted for neatly by the conceptualization within feature geometry of features being arranged in a particular 'hierarchy'. It has been observed in several languages (eg. Menomini and Maasai) that a number of assimilation processes are dependent on the presence of some contextual feature shared by both targets and trigger (cf. Cole 1987:4). This has been referred to by Cole as 'parasitic' harmony. While most assimilatory processes operate in a feature-filling way and will be blocked only by specification for the harmonic feature (Cole 1987:4), it is observed that 'in parasitic harmony, an additional class of blocking segments is created by the presence of segments which do not bear the appropriate contextual features' (Cole 1987:27). The identity of the contextual feature is not immaterial: [+high] would not spread from a segment marked [+low] to a segment similarly marked [+low], for example. In cases of 'parasitic' harmony, it appears that a feature which is dependent on the presence of a second feature in the particular language system spreads from a trigger onto adjacent target(s) which bear that second feature. As such, the term 'parasitic' seems to fall out naturally from the conceptualization within feature geometry of some features being dependent upon others – i.e. as a 'hierarchy' rather than as unordered sets within matrices. In chapter eight of this thesis, 'parasitic' harmony is examined in Kusmi and Hubaiʃi whereby the lexical spread of [+round] from a trigger in one morpheme to a target in an adjacent morpheme is 'parasitic' on the presence of the contextual feature, [+high].

0.4.1.5.4. The present model:

Within the account here, it is assumed that features are arranged hierarchically in a feature tree. However, we also act on the insights afforded by underspecification. Trees are underspecified to the extent that non-distinctive nodes are absent in the representation (and cf. Pulleyblank 1988:242). The presence of one feature assumes the existence of the root node together with all other nodes which lie between the node on which the feature appears and the root node. As Pulleyblank states:

> 'The presence of even one feature would force the presence of a root node simply because of the intrinsic structure of the feature hierarchy.' (Pulleyblank 1988:288)

[+F] is marked for a phoneme underlyingly if and only if the feature [F] is both present and distinctive for that phoneme; therefore, the absence of a possible feature marking implies, either, absence of the relevant terminal node, or, that the feature is non-distinctive for the phoneme. For example, the existence of a default rule supplying [+H] ([+high]) to a vowel marked [+R] ([+round]) renders it unnecessary to specify [+H] for a vowel which is already marked [+R]. The default rule reads:

D.R. [ ] ---> [+H]/[__,+R]

And while there may be a case to be forwarded for [-H], for example, because tongue height features are gradual rather than privative or equipollent, there is no way in which a segment can be said to be [-coronal] any more than a segment can be said to be [-velaric suction] in non-click languages, or a vowel can be said to be [-inrounded] in any language other than one in which two types of rounding are distinctive (eg. Swedish).

If this framework is assumed, and it is proposed that [+Cl] ([+coronal]) implies the existence of the zone node, the supralaryngeal node, the laryngeal node and the root node; and [+N] ([+nasal]) implies the existence of the supralaryngeal node, the laryngeal node, and the root node, (plus, by default, the terminal nodes [+sonorant] and [+voiced]), then it is unnecessary to specify all nodes in the description of every rule. I shall capitalise on the insights provided by both underspecification and feature geometry and provide minimal representation within the model. Employing this revision, the NSC receiving its content by means of spread from /m/ is diagrammed as below:

```
[+Lb]
  |
[+N]
  |\
  m  X       --->       m  m
```

[+Lb] ([+labial]) goes along for the ride as well as all features on nodes lying between [+N] and the root node. Since labial and nasal are situated on different nodes which operate independently from one another, it is possible to invoke partial assimilation by spreading only the top node:

```
[+Lb]
  | \
[+N] \
  |   \
  m    X     --->       m  p
```

0.4.1.6. Notes on transcription symbols used:

On the whole, symbols for the transcription used are standard, such that a regular five vowel system with two mid-vowels appears as /i,e,a,o,u/. And a regular three vowel system, as in these dialects, appears as /a,i,u/.

The consonants are transcribed according to the IPA system as far as possible. In the twenty six and twenty seven consonant inventories of Hubaiʃi and Kusmi and Gabiini, the following consonants are transcribed in a standard way, viz:

/b,m,f,t,d,s,z,n,l,r,ʃ,k,q,w,j,h,ʔ/

Digraphs are employed to denote fricatives (other than the labio-dental fricative, /f/, the sibilants, /s,ʃ,S/, and the uvular fricative which is denoted by a lower case /x/), thus /dh/ represents the IPA /ð/, and /th/ represents IPA /θ/ where Arabist usage would generally be /d̲/ and /t̲/ with subscript diacritics. The voiced uvular fricative is transcribed as a digraph /gh/ and not as in IPA and Arabist transcription, /ɣ/.

The voiced palatal obstruent is denoted as /g/, and not as /ɟ/ in the IPA system. This should cause no confusion since there is no voiced velar obstruent in any of the three consonantal systems with which the former could be confused.

The voiceless pharyngeal fricative and the pharyngealised consonants, are transcribed with capitals, (/H,T,S,Dh/), rather than with the conventional subscript dot used by Arabists, (/ḥ,ṭ,ṣ,ḍ/), or the tilda used in IPA, (/ħ,ƚ,ȿ,ɗ/). The voiced pharyngeal is transcribed as a superscript /^{c}/ and not, as in IPA, a reverse 'question mark' (ʕ).

The palatalised affricate variant of final /ki/ in Kusmi is represented as a digraph [tʃ] which corresponds to IPA usage. The other (less fronted) palatalised variant of /ki/ is represented as a digraph with a subscript '$_j$', viz: [k_j].

Labialisation is represented by means of a superscript '^{W}', as in, [k^W] and [m^W]; this contrasts marginally with the accepted IPA symbol - where 'w' may be written on the same level as the labialised consonant (IPA 1977:14).

Nasalisation is denoted by the IPA tilda above the affected segment, as in: [ĩ], [ũ].

Glottalisation of consonants (i.e. ejectives) is denoted by a following ', as in [k'] for the velar ejective, and [t'] for the coronal ejective and is in keeping with IPA symbolism (IPA 1977:17).

Geminate consonants and durationally long vowels are represented as double letters, i.e. [CC] and [VV] as in [tt] and [aa] of the lexemes: <u>ka[tt]ab</u> 'he caused to write' and <u>k[aa]tib</u> 'writer'. This contrasts with the IPA method of adding a colon to denote length, <u>k[a:]tib</u> 'writer' and <u>ka[t:]ab</u> 'he caused to write'.

0.4.1.6.1. Other symbols and abbreviations:

Four types of brackets are employed for the representation of sounds; these are: slanted brackets, //, which are used for the representation of phonemes - eg. as in the representation of the vocalic inventory of an underlying three vowel system, /i,a,u/; square brackets, [ ], which have two functions: firstly, the representation of phonetically realised sounds in isolation, as in [k^W], a labialised realisation of the phoneme /k/; and secondly, the highlighting of segments which have undergone change, as in:

/k a t a b + k u/ ---> k a t [u] b k 'I wrote' (Hub.)

inverted commas, ' ', are used to denote elements which can be described neither as phonemes nor as phonetically realised segments. Inverted commas would be used, for example, in the statement: "?' is non-specified at the post-lexical level and is specified [+guttural] at the lexical level.' Finally, round brackets, ( ), are used for non-phonological (?) and/or (a) - as in the definite article, a few nominal forms, certain imperative forms and certain derived verbs in the perfect aspect which require [?] and [a] in initial position but where the highlighted elements do not include [?a]. Brackets are also used for epenthetically-inserted segments which are not highlighted, viz:

(? a) [t] s a r w a l a	'she put on <u>sirwaal</u>' (Hub.)
(? a) l m a d r a s [a]	'the school'
b i n t (u) h u m	'their m. daughter'

Finally, note that where data is provided, it is assumed that the data is attested in all three dialects (Hubaiʃi, Kusmi and Gabiini), unless otherwise stated by means of abbreviation. In this case, (Hub.) implies that the example is attested in Hubaiʃi but in neither of the other dialects (as in the examples given above), just as (Kus.) implies that the example is attested only in Kusmi, and (Gab.) that the example is attested in Gabiini only.

CHAPTER ONE

Syllabification in the Dialects

In this chapter, I wish to examine the set of permissible syllable types in Hubaiʃi, Kusmi and Gabiini. I shall begin by considering words and morphemes in isolation. Viewing words and morphemes in isolation presents a complex array of syllable types. As I continue to consider syllable types restricted to initial position, it will be seen that the set of possible types is more restricted than at first envisaged. I shall then look at the syllable in utterance-final position. Within this section, I shall consider both those structures which are restricted to utterance-final position and those which are necessary in utterance-final position. Collocational restrictions will also be discussed. It will be noted that a sonority hierarchy is observed when two consonants occur in utterance-final position. I shall continue by discussing the obligatory formation of closed syllables when a vowel occurs in utterance-final position. It will be concluded that utterance-final syllables are exceptional and that it is not infelicitous to propose the second of two adjacent consonants in utterance-final position or the utterance-final consonant in a VVC sequence as syllabified. It is seen that while in utterance-final position collocational restrictions observed in the three dialects are similar, yet not identical, the same syllable template should be established for Hubaiʃi, Kusmi and Gabiini since permissible syllable structure will be seen to be identical in all three dialects.

I shall then determine the most appropriate type of syllable template. Arguments for a flat versus a configurational template will be forwarded. Within this discussion, accentuation, collocational restrictions and representation of the minimal and maximal syllables will be taken into account. It will be seen that accentuation is not concerned solely with the weight of the rhyme; collocational restrictions within the nucleus and within the rhyme then provide further evidence for a hierarchical syllable structure. In view of the status of the rhyme, and the need to recognise a hierarchy of sonority - in terms of peak, onset and coda - it is felt that some form of hierarchical syllable representation is essential. On the flat template, the 'syllable cannot be viewed as having internal structure, nor could it be represented as part of a higher order prosodic tree' (Selkirk 1982:356). In view of the dependence of the coda on the peak and its optionality in non-utterance-final position, postulation of coda as an independent syllable constituent is ruled out. On the configurational template, the traditional coda is a branch of the rhyme. The fact that the coda is a branch of the rhyme is sufficient to indicate a left-to-right dependency relation. Syllable constituents are therefore determined as: onset, rhyme and nucleus.

Having established the syllable constituents and representation of the syllable template for the dialects, I shall turn to consider the process of syllabification. To this end, I shall consider an algorithm for well-formed syllabification. Syllabification applies from left-to-right, and remains in accordance with the well-documented 'Onset First Principle'. The formal recognition of well-formedness in the light of the permissible template is seen as:

> 'within a syntactic domain specified for the language, the syllabic structure of the representation (must) be <u>non-distinct</u> from the template' (Selkirk 1982:345)

I shall then consider divergences from the normal process of syllabification in terms of resyllabification whereby one possible syllable template is replaced by another. This chapter will be concluded by an examination of phonological processes available to preserve structure - in terms of disassociation, desyllabicisation, complex consonant formation and epenthesis in case a concatenation of morphemes yields unsyllabified strings.

1.1. Syllable types:

1.1.1. Words in isolation:

Words or single morphemes uttered in isolation provide the following syllable types. These are attested in all three dialects. Syllable types will be introduced informally in terms of CV sequences. "." denotes syllable boundary (as in Archangeli 1984a):

CV	.w a.	'and'
CVV	.n i i.	verbal object pronoun 'me'
CVC	.k u m.	verbal object pronoun 'you m.pl.'
CVCC	.b i n t.	'girl'
	.f a S l.	'division, class'
CVVC	.q a a l.	'he said'
CCV	.s k u.t i i.	'be quiet f.s.!'
	.g l i.s i i.	'sit f.s.!'
CCVC	.s k u t.	'be quiet m.s.!'
	.g l i s.	'sit m.s.!'
	.s k u b.	'pour m.s.!'
	.s b u r.	'wait m.s.!'

but not:

*CCVVCC, CCVVC or CCVCC

1.1.2. Words in continuous utterance:

The data above present us with a complicated array of syllable types.

Returning to the original data, and supplying additional utterance-boundary information indicated by means of brackets, it is noticed that a number of the above syllable types attested in isolation do not manifest themselves in continuous utterance. The picture is simplified immensely. I shall examine both attested and non-attested syllables. The relevant syllable/s in the utterance is/are underscored:

1.1.2.1. positive:

.CV.	.w a. q a.t a.l u m	'and they m. killed'
.CVC.	.q a.t a l.k u m. b u.n i j.j a	'you m.pl. killed a girl'
.CVV.	.s a a.f i r	'travel m.s.! go!'
.CVVC.	.q a a l.]$_\varphi$	'he said'
.CVCC.	.b i n t.]$_\varphi$	'girl'
.CCV.	[$_\varphi$.s k u.t i i.	'be quiet f.s.!'
.CCVC.	[$_\varphi$.s k u b.	'pour m.s.!'
	[$_\varphi$.s b u r. d a.q i i.q a	'wait a minute m.!'

1.1.2.2. negative:

.CV.	* .w a.]$_\varphi$
.CVV.	* .n i i]$_\varphi$
.CCV.	* .w a. s b u.r i i.
.CCVC.	* .w a. s b u r.
.CCVC.	* .q u l. s b u r.
.CVCC.	* .b i n t. f u l a a n
.CCVCC.	* .s b u r d. d a.q i i.q a

From 1.1.2.1. and 1.1.2.2. above, it is observed that:

i. CCV sequences are restricted to utterance-initial position.

ii. CVCC and CVVC are restricted to utterance-final position.

iii. CV(V) may not surface to the immediate left of a utterance-boundary.

iv. Within the utterance only CV, CVV, and CVC are attested.

In the first instance I shall consider syllable types which are restricted to utterance-initial and utterance-final position.

1.2. Initial consonant clusters:

Let us deal firstly with initial consonant sequences: it is observed that any initial consonant cluster is restricted to utterance-initial position; Within the utterance consonant clusters are not realised in onset position. The three sequences below are unattested. (The correctly syllabified versions are provided in brackets.):

.CV.CCVC.	* .w a. <u>g l i s</u>.	(.w a g. l i s.)	'and sit m.s.!'
.CV.CCVC.	* .w a. <u>s b u r</u>.	(.w a s. b u r.)	'and wait m.s.!'
.CVC.CCVC.	* .q u l. <u>s b u r</u>.	(.q u. l [u] s. b u r.)	'say wait m.s.!'

In the case of concatenation of the morphemes in the former two instances, the first consonant of the imperative form is assigned to the coda of the preceding syllable; and in the latter case, the first consonant of the imperative is unsyllabified and triggers vowel epenthesis.

It is also seen that initial CC sequences are highly prone to alternation with initial non-CC forms - i.e prothesis can ensue - in particular, in careful speech, viz:

.CCVC.	.s k u t.	or	.CVC.CVC.	.[? u] s. k u t.
.CCVC.	.g l i s.	or	.CVC.CVC.	.[? i] g. l i s.

1.2.1. Extra-syllabicity of the first consonant:

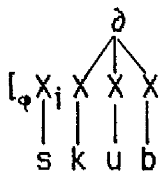
There are, indeed, collocational constraints on the consonants which may appear initially in CC sequences; this may be stated by implication as:

a) when the second consonant is a non-nasal sonorant, the first consonant is either a stop or a sibilant.

b) when the second consonant is a stop, the first is a sibilant.

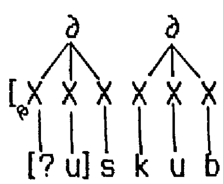
While the fact that prothesis is only optional in specific cases does suggest that the constraint on non-branching onsets is beginning to crack, it is suggested that the first consonant of these CC sequences is generally judged to be extra-syllabic today and does not influence the syllable template.

On a flat syllable template, extra-syllabicity is diagrammed as below:



'pour m.s.!'

In careful speech, the extra-syllabic consonant triggers prothesis of a rhyme-headed X slot which in turn triggers prothesis of a non-rhyme-headed X slot and is rendered syllabified, viz:



'pour m.s.!'

Having removed CCV sequences from the list of syllable types, the number of possible syllable types that occur in non-utterance final position has been narrowed down to three, namely:

CV

CVV

CVC

CV constitutes the minimal syllable and CVC and CVV the maximal syllables respectively. This accords with the basic syllable types attested in Classical Arabic (McCarthy 1985:23).

1.3. Utterance-final syllables:

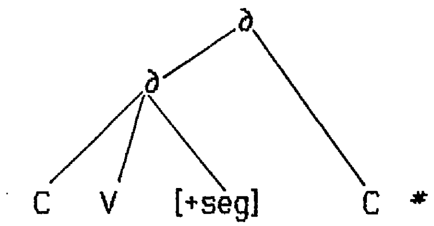
Let us now consider the position of syllables attested in utterance-final position and only in utterance-final position.

1.3.1. Superheavy syllables:

It is noted that the superheavy syllables CVCC and CVVC occur in all three dialects but are restricted to utterance-final position; this is in contrast to some other Modern Arabic dialects (such as Damascene and Cairene) where superheavy syllables are not limited to utterance-final position but occur in phonological word-final position within the utterance (cf. McCarthy 1985:28). Consider the following attested sequences:

i.	b i n t]$_{\varphi}$	'a girl'
	? a b S a r k]$_{\varphi}$	'you m.s. saw' (Hub.)
	? i b T]$_{\varphi}$	'armpit'
ii.	q a a l]$_{\varphi}$	'he said'
	s a a r]$_{\varphi}$	'he went'
	m u q a w w i t i i n]$_{\varphi}$	'qāt-dealers m.'

The question concerns whether the final consonant is to be considered extra-syllabic (as in the case of the initial consonant in initial consonant clusters), or whether it is syllabified. Unless exceptionality in utterance-final position is to be allowed, it will be necessary to posit some notion of extra-syllabicity. McCarthy treats superheavy syllables in Classical Arabic and in the dialects (Damascene and Cairene) by Chomsky-adjoining the final (in his terms, extrametrical) C to the preceding syllable (McCarthy 1979:451, 1985:27, 111-2), viz:



(McCarthy 1979:451,1985:27)

He states:

> 'It follows then that superheavy syllables have two rhymes, the first branching and the second non-branching. This makes them logically equivalent to words with heavy penults and light ultimas to which they are related historically.' (McCarthy 1985:111-2)

1.3.1.1. Utterance-final collocational constraints:

However, while the first consonant of an utterance-initial consonant sequence is considered to be extra-syllabic, a similar notion of extra-syllabicity will not be forwarded to explain away the final consonant in this position. On the one hand, these syllable types are doubtless related historically to 'words with heavy penults and light ultimas', and facts of accentuation corroborate this claim - it will be seen that word stress falls on an ultimate rhyme if and only if it contains three constituents at the level of zero-projection; likewise, the heavy penult of a word with a light ultima would receive stress. On the other hand, however, the synchronic evidence is that superheavy syllables do constitute syllable types in their own right. It is shown below that distinct phonotactic constraints, which are not available in Classical Arabic, are operative in utterance-final position in these dialects: in Hubaiʃi, Kusmi and Gabiini, a sonorant may not occur in utterance-final position to the immediate right of a laryngeal fricative, for example. The forms on the left are underlying representations. The forms on the right are attested in utterance-final position:

/b a H r/ --->	b a H [a] r]φ	'sea'
/ʃ a h r/ --->	ʃ a h [a] r]φ	'month'
/l a H m/ --->	l a H [a] m]φ	'meat'

The words are realised as below in context:

(? a) l b a [H r] (a) l a H m a r	'the Red Sea'
ʃ a [h r] (a) l^{C} a s a l	'honeymoon'
(? a) l l a [H m] (a) T a^{C} i i m	'the meat is tasty'

(Bracketed elements - eg. (a) - are realised as a result of epenthesis)

The major problem associated with the McCarthy analysis concerns the status afforded to the Chomsky-adjoined element within the present framework. The (potential) onset is the most obvious choice - and, probably, the only choice. However, the claim that the final consonant of a superheavy syllable occupies a potential onset slot leads to difficulties in explaining collocational restrictions within final consonant sequences. It is seen above that there is no restriction on the general occurrence of a laryngeal fricative to the immediate left of a sonorant - a sonorant quite happily occupies the onset slot of a syllable within the utterance to the right of a syllable ending in a laryngeal fricative.

It is suggested that final consonant sequences in these dialects are syllabified if and only if they accord with a left-to-right decreased sonority hierarchy. To say that the sonority hierarchy operates in the rhyme is far more economical a statement than to say that in certain environments sonorants may not occupy potential onset slots.

Matrices:

The following consonant matrices for the three dialects show those consonant sequences which are attested in utterance-final position, those consonant sequences which are not attested in utterance-final position but are attested as sequences in phonological word-final position, and those consonant sequences which are apparently not attested in phonological word-final position:

Hubaiʃi

	b	m	f	dh	th	t	d	s	z	n	l	r	ʃ	g	k	gh	x	Dh	T	S	H	c	q	w	j	h	?
b	/			+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+				
m	+	/			+	+	+	+	+	+	+	+	+		+		+				+	+	+		+		
f			/	+		+	+	+	+	+	+	+	+	+	+			+	+		+	+	+				
dh	+	+	+	/						+	+	+	+		+						+	+	+				
th	+	+	+		/					+	+	/	+	+	+	+							+				
t	+	+	+			/		+		+	+	+	+		+	+	+				+	+	+				
d	+	+	+				/	+		+	+	+	+		+	+	+			+	+		+	+			
s	+	+	+			+	+	/		+	+	+	+	+	+		+		+		+	+	+				
z	+	+	+						/	+	+	+	+		+							+	+				+
n	+		+	+	+	+	+	+	+	/			+	+	+		+		+	+	+	+	+				
l	+	+	+		+	+	+	+			/		+	+	+	+	+		+	+	+	+	+	+			
r	+	+	+	+	+	+	+	+	+	+		/	+	+	+	+	+	+	+	+	+	+	+			+	
ʃ	+	+	+			+	+			+	+	/	/	+	+	+	+		+		+	+	+				
g	+	+	+	+		+	+	+	+	+	+	+	+	/	+						+	+				+	
k	+	+	+		+	+	+	+	+	+	+	+	+		/			+									
gh	+	+	+		+	+	+		+	/	/	/	+		+	/		+									
x	+	+	+	+		+	+	+	+	/	/	/	+				/			+			+				
Dh	+	+	+			+	+			+	+	+	+			+		/			+	+		+			
T	+	+	+	+	+			+		+	+	+	+				+		/		+	+					
S	+	+	+			+	+			+	+	+	+							/	+	+	+				
H	+	/	+		+		+			/	/	/	+	+	+					+	/			+			
c	+	/			+	+	+	+	+	/	/	/	+	+	+			+				/					
q	+	+	+	+		+	+	+		+	+	+	+						+		+	+	/				
w	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	/		+	
j	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		/	+	
h	+	/	+		+		+	+		/	/	/	+		+				+				+	+			
?	+							+		+		+															

Kusml

	b	m	f	dh	th	t	d	s	z	n	l	r	ʃ	g	k	x	Dh	T	S	H	c	q	w	j	h	?
b	/			+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+				
m	+	/			+	+	+	+	+	+	+	+	+		+	+				+	+	+		+		
f			/	+		+	+	+	+	+	+	+	+	+	+		+	+		+	+	+				
dh	+	+	+	/						+	+	+	+		+				+	+	+					
th	+	+	+		/					+	+	/	+	+	+								+			
t	+	+	+			/		+		+	+	+	+		+	+				+	+	+				
d	+	+	+				/	+		+	+	+	+		+	+			+	+		+	+			
s	+	+	+			+	+	/		+	+	+	+	+	+	+		+		+	+	+				
z	+	+	+						/	+	+	+	+		+						+	+				
n	+		+	+	+	+	+	+	+	/			+	+	+	+		+	+	+	+	+				
l	+	+	+		+	+	+	+			/		+	+	+	+		+	+	+	+	+	+			
r	+	+	+	+	+	+	+	+	+	+		/	+	+	+	+	+	+	+	+	+	+			+	
ʃ	+	+	+			+	+			+	+	/	/	+	+	+		+		+	+	+				
g	+	+	+	+		+	+	+	+	+	+	+	+	/	+					+	+				+	
k	+	+	+		+	+	+	+	+	+	+	+	+		/		+									
x	+	+	+	+		+	+	+	+	/	/	/	+			/			+			+				
Dh	+	+	+			+	+			+	+	+	+				/			+	+		+			
T	+	+	+	+	+			+		+	+	+	+			+		/		+	+					
S	+	+	+			+	+			+	+	+	+						/	+	+	+				
H	+	/	+		+		+			/	/	/	+	+	+				+	/			+			
c	+	/			+	+	+	+	+	/	/	/	+	+	+		+				/					
q	+	+	+	+		+	+	+		+	+	+	+					+		+	+	/				
w																							/			
j																								/		
h	+	/	+		+		+	+		/	/	/	+		+			+				+	+			
?	+							+		+		+														

Gablini

	b	m	f	dh	th	t	d	s	z	n	l	r	ʃ	g	k	x	Dh	T	S	H	c	q	w	j	h	?
b	/			+	+	+	+	+	+	+	/	/	+		+	+	+	+	+	+	+	+				
m	+	/			+	+	+	+	+	+	/	/	+		+	+				+	+	+		+		
f			/	+		+	+	+	+	+	/	/	+	+	+		+	+		+	+	+				
dh	+	+	+	/						+	+	+	+		+				+	+	+					
th	+	+	+		/					+	/	/	+	+	+								+			
t	+	+	+			/		+		+	+	+	+		+	+				+	+	+				
d	+	+	+				/	+		+	+	+	+		+	+			+	+		+	+			
s	+	+	+			+	+	/		+	+	+	+	+	+	+		+		+	+	+				
z	+	+	+						/	+	+	+	+		+						+	+				+
n	+		+	+	+	+	+	+	+	/			+	+	+	+		+	+	+	+	+				
l	+	+	+		+	+	+	+			/		+	+	+	+		+	+	+	+	+	+			
r	+	+	+	+	+	+	+	+	+	+		/	+	+	+	+	+	+	+	+	+	+			+	
ʃ	+	+	+			+	+			+	+	/	/	+	+	+		+		+	+	+				
g	+	+	+	+		+	+	+	+	+	+	+	+	/	+					+	+				+	
k	+	+	+		+	+	+	+	+	+	+	+	+		/		+									
x	+	+	+	+		+	+	+	+	/	/	/	+			/			+			+				
Dh	+	+	+			+	+			+	+	+	+				/			+	+		+			
T	+	+	+	+	+			+		+	+	+	+			+		/		+	+					
S	+	+	+			+	+			+	+	+	+						/	+	+	+				
H	+	/	+		+		+			/	/	/	+	+	+				+	/			+			
c	+	/			+	+	+	+	+	/	/	/	+	+	+		+				/					
q	+	+	+	+		+	+	+		+	+	+	+					+		+	+	/				
w																							/			
j																								/		
h	+	/	+		+		+	+		/	/	/	+		+			+				+	+			
?	+							+		+		+														

The matrices are to be read as follows:

The rows depict the consonant to the immediate left of the utterance-final boundary; the columns depict the adjacent consonant.

'+' denotes all those consonant sequences which do surface in the pattern CV[CC]]Q either lexically, or as a result of suffixation (inflection, object pronoun, negative, etc.).

The strokes ('/') denote all those consonant sequences which do appear in some phonological position as [CC], but which cannot be analysed as such in utterance-final position, eg.

i.	(? a) l b a [H r] (a) l a H m a r	'the Red Sea'
	b a H [a] r] Q	'sea'
ii.	H a [b b] a	'she loved' (Hub.)
	H a [b b] i t	'she loved' (K./G.)
	H a [b]] Q	'he loved'

A gap in the matrix denotes all those consonant pairs which (apparently) do not occur as sequences in any position. This lack of occurrence may be due to, either:

a) an absence of lexical roots containing the relevant two consonants as ultimate and penultimate consonants;

or, b) an absence of the relevant morphological pattern for a lexical root which does contain the two consonants in question as ultimate and penultimate consonants;

or, c) one or other of these possibilitities together with the lack of possibility of deriving the relevant consonantal sequences by means of morpheme concatenation - eg. inflection.

Of these, a) includes:

i. accidental gaps - i.e. gaps for which there is no phonological motivation;

ii. phonologically-motivated gaps - such as the lack of two contiguous homorganic consonants with different voicing or manner of articulation, as in:

* th dh, * x gh, * t d, *s z, *l r, (cf. Greenberg 1950)

iii. morphologically-motivated gaps - due to cooccurrence restrictions in the consonantal root as illuminated by Greenberg (1950) and noted by McCarthy (1985:229), certain combinations of root consonants are ruled out, eg: * t-ʃ-s
μ

iv. and, inevitably, gaps in my data collection - where, either I have been unable to elicit certain forms, or, the forms in question did not constitute part of the informants' grammar.

It is, however, not the gaps that are of interest as much as those consonant sequences which are attested in some phonological position, but which are not attested in utterance-final position. This suggests that, when a lexical root may be inserted into the morphological template of the shape:

$$X \; X \; X_a \; X_b$$

the sequence X_a X_b is either reduced or split up in utterance-final position, because the two consonants in question may not cooccur within the same syllable constituent.[1]

1. Note that the frequent occurrence of [k] as the utterance-final consonant in a consonant sequence is not due to the presence of a large number of lexical 'final-k' roots, rather, to the fact that in the perfect aspect of the verb, /k/ is the (initial) consonant of the {first} and {second} subject pronouns in these three dialects. It may be assumed that a matrix for one of the 't-dialects' would show a similarly frequent occurrence of [t] as the final segment. The frequent occurrence of [ʃ] is likewise due to inflectional rather than to lexical facts (/ʃ/ negative suffix, /ʃ/ {second feminine singular} object pronoun/possessive determiner and subject pronoun in the perfect aspect of the verb in Qabiini).

1.3.1.1.1. Geminate consonants:

In all three dialects, as in Cairene Arabic (Broselow 1976), it is noted that geminate consonants are ruled out in utterance-final position. The underlying representations are given on the left, the attested sequences in utterance-final position are given on the right:

/H a b b/ --->	H a b]φ	'he loved/love'
/ʃ a x x/ --->	ʃ a x]φ	'he pissed'
/k u l l/ --->	k u l]φ	'all, everything'
/ʃ a n n/ --->	ʃ a n]φ	'he seived'

In non-utterance-final position, the sequences remain geminate:

H a [b b] (a) n i i	'he loved me'
k u [l l] u h	'all of it m.' (Kus./Gab.)
K u [l l] u	'all of it m.' (Hub.)
k u [l l] (a) w a a H i d	'everyone'
ʃ a [n n] (a) l q a m H	'he seived the wheat'

The data suggest that a rule of degemination exists in utterance-final position:

Degemination:

X X X_i X_i]φ

[F^n] (where [F^n] = all features)

This affects the form for 'he loved' as follows:

X X X_i X_i]φ ---> H a b]φ 'he loved'

H a b

The consonant is disassociated from the right-most X slot.

1.3.1.1.2. Sonority hierarchy:

In addition to the prohibition of two adjacent identical consonants in utterance-final position, no voiceless coronal fricative occurs in a final syllable to the immediate left of the vibrant, (r): again, the forms on the left are underlying representations, the forms on the right are attested utterance-final forms:

/? a th r/ --->	? a th [a] r] φ	'trace'
/q i ʃ r/ --->	q i ʃ [a] r] φ	'coffee husks' (Gab)

In utterance-final position, no coronal sonorant (n,l,r) appears to the immediate right of any voiced guttural or guttural fricative (h,H,^{c},gh,x), viz:

/d u x l/ --->	d u x [u] l] φ	'entry'
/ʃ a h r/ --->	ʃ a h [a] r] φ	'month'
/ʃ u gh l/ --->	ʃ u gh [u] l] φ	'work' (Hub.)
/ʃ u ^{c} l/ --->	ʃ u ^{c} [u] l] φ	'work' (Küs./Gab.)

Mitchell noted a similar phenomenon for the dialect of Cyrenaican. In this case, nouns of the Classical Arabic pattern: C_1[a]C_2C_3 where C_2 is x, gh, H, ^{c}, or h, and C_3 is usually l, r, or m, usually correspond to a disyllabic (and oxytonic) structure: CVCVC, eg.

<u>CA</u>	<u>Cyr.</u>	
n a x l	n u x a l	'palm'
b a gh l	b u gh a l	'mule'
ʃ u gh l	ʃ u gh a l	'work'

(Mitchell 1960:388)

No sonorant (m,n,l,r) appears to the immediate right of a laryngeal or pharyngeal fricative, viz:

/s a h m/ --->	s a h [a] m] φ	'share'

/l a H n/	--->	l a H [a] n]φ	'tune'
/s a h l/	--->	s a h [a] l]φ	'easy'
/b a H r/	--->	b a H [a] r]φ	'sea'

Interdialectal discrepancies can be explained as follows:

In Kusmi and Gabiini, /gh/ does not constitute a phoneme in its own right: it has merged with /^{c}/ (and cf. 3.3.1.).

In Gabiini, in addition to constraints on the occurrence of fricatives and gutturals to the left of sonorants, all sequences of labial (b,m,f) and liquid (r,l) are ruled out in utterance-final position.

In regard to collocational constraints of non-identical consonants in utterance-final position, the following conclusions can be drawn based on implication:

i. When constraints exist on labial - liquid sequences, restrictions exist between voiceless fricatives and liquids;

ii. When constraints exist between voiceless fricatives and liquids, restrictions exist between voiced and fricative gutturals and liquids;

iii. When constraints exist between the labial nasal, /m/, and fricatives, restrictions exist between the coronal nasal, /n/, and fricatives.

In all dialects, final /r/ will be affected by collocational constraints prior to final /l/; final liquids will be affected by collocational constraints prior to final nasals; final /n/ will be affected by collocational constraints prior to final /m/. This suggests that a sonority hierarchy exists among the sonorants: in order of strength: m > n > l > r

A sonority hierarchy also exists among consonants whose occurrence to the left of sonorants is constrained: in this case, the hierarchy is seen in terms of the zone of constriction: guttural > coronal (fricative) > labial

This is taken to mean that when a labial does not occur to the left of a sonorant in utterance-final position, neither does a coronal fricative; and when a coronal fricative does not occur to the left of a sonorant in utterance-final position, neither does a guttural.

1.3.2. Utterance-final coda formation:

Collocational constraints provide us with just one reason for considering utterance-final consonant sequences well-motivated. A second reason for proposing final superheavy syllables to be well-motivated is that no final vowel (whether durationally short or long) is attested in this position: thus, while in general, the minimal syllable is seen as CV, and a CVV syllable type is equally well-motivated, neither of these syllable types is attested utterance-finally. The underlying representation is given on the left, its realisation in utterance-final position on the right:

a) i.	/w a/	w a [?]] φ	'and'
	/h i/	h i [h]] φ	'she'
	/h u/	h u [h]] φ	'he'
	/m a d r a s a/	m a d r a s a [h]/[?]] φ	'school' (Hub.)
	/m a d r a s a/	m a d r a s a [h]] φ	'school' (Kus./Gab.)
ii.	/k a t a b + k u/	k a t [u] b [k]] φ	'I wrote' (Hub.)
	/k a t a b + k u/	k a t a b [k^W]] φ	'I wrote' (Kus.)
b)	/n i i/	n i [j]] φ	'me' (verbal object pronoun)
	r a S a d + u u]	r a S a d u [w]] φ	'they m. wrote' (H.)
	n a a]	n a [?]] φ	'we/us/our'(object/subject

pronoun/poss. determ.)

When a vowel-final morpheme occurs in utterance-final position, three processes conspire to preserve structure. In the case of short vowels, the unsyllabified vowel either triggers insertion of a non-rhyme-headed X slot with which a laryngeal ([h] or [?]) subsequently associates, as in a)i., or the unsyllabified vowel is deleted by means of bare nucleus deletion following the disassociation (and reassociation) of vocalic features, as in a)ii. (and cf. 2.1.1.1.1.1. and 8.4.3.3.1.). In the case of long vowels, structure is preserved by means of diphthongisation. Since the treatment of final vowels in utterance-final position will be taken up in more detail in chapter two, I shall not elaborate beyond showing the relevant implications of these processes:

1.3.2.1. Consonant epenthesis:

In this case, the unsyllabified vowel triggers insertion of an X slot (with which [?] or [h] subsequently associates), viz:

```
   |                 |
X  X  ^ ]φ   --->  X  X  X]φ
|  |  ↑            |  |  |
w  a  |            w  a  ?
      |
      X
```

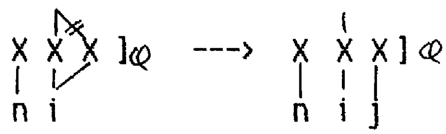
1.3.2.2. Bare nucleus deletion:

In bare nucleus deletion the X slot is disassociated, as formalised below:

```
R
|
N
+
X ]φ
```

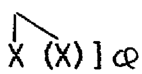
1.3.2.3. Diphthongisation:

In this case, the right-most X slot is disassociated from the rhyme-head, viz:



It is precisely an open syllable which is ruled out in utterance-final position. The negative condition is formalised as below:

1.3.2.4. *



While it is argued above that extra-syllabicity needs to be invoked in utterance-initial position, the final element of a CVVC or CVCC syllable in utterance-final position is not seen to be extra-syllabic. Infelicities are attached to such a position: by resorting to extra-syllabicity, it would be necessary to abandon the claim that every utterance-final syllable is closed. A natural generalisation would be lost - in all non-utterance-final positions CV constitutes the minimal well-formed syllable; in utterance-final position, however, the minimal well-formed syllable is CVC; in all non-utterance-final positions, CVC or CVV constitutes the maximal syllable; in utterance-final position, however, the maximal well-formed syllable is CVVC or CVCC. I do not believe it is infelicitous to regard utterance-final CVVC and CVCC as well-formed, since syllabification actually conspires to produce closed syllables when they do not exist morphologically.

1.4. Representation of the syllable:

Having established the set of permissible syllable types in the dialects, it is necessary to determine the identity of the syllable template in terms of number and type of constituents, and the relationship between constituents.

1.4.1. The syllable template:

In determining the identity of the syllable template, I shall map skeletal points onto two types of syllable template: flat and configurational. This will allow an examination and a comparison of the merits of different templates in the light of necessary generalisations and distinctions to be captured. The two template types, as will be seen, do not share the same assumptions.

1.4.1.1. The flat template:

The flat template assumes that the syllable constitutes a unit with no internal grouping or cohesion of elements such as to require the recognition of an intermediate level of (intrasyllabic) organisation. A flat syllable template of the maximal syllable attested within the utterance in these dialects is given below:

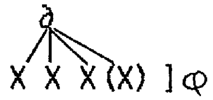
∂

X X (X) i.e. CV(V/C)

((X) is an optional element which may be either C or V.)

This template expresses the claim that the maximal non-utterance-final syllable in the language comprises three X slots, and the minimal, two.

A flat syllable template of the maximal syllable attested in utterance-final position is given as:



i.e. CVC(C) / CVVC] φ

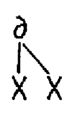
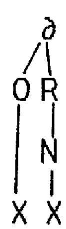
This template expresses the claim that the maximal utterance-final syllable comprises four X slots, and the minimal, three.

1.4.1.2. The configurational template:

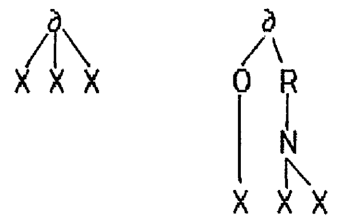
The configurational template, on the other hand, assumes the existence of distinct intermediate syllable constituents at different levels of projection within the syllable. The idea of syllables having internal hierarchical structure is not new: the earliest explicit reference to syllables having hierarchical structure is in Pike and Pike 1947 (cited in McCarthy 1985:15). Different levels of projection allow sequences which are identical at the level of zero-projection to be represented distinctly in terms of structure. If distinct levels of projection are a reality in the language, it is the configurational template which is required; if, on the other hand, it is felt that only the level of zero-projection is significant, the flat template captures the necessary generalisation with greater simplicity.

1.4.2. Flat v. configurational:

Let us examine the way in which the two template types treat the possible syllables structurally:

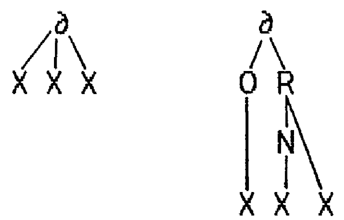
	<u>flat</u>	<u>configurational</u>	<u>syllable type</u>
a)			CV

b)



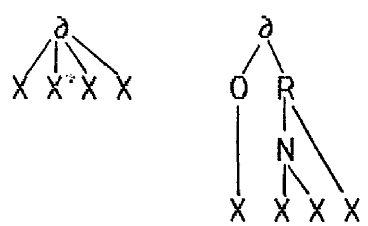
CVV

c)



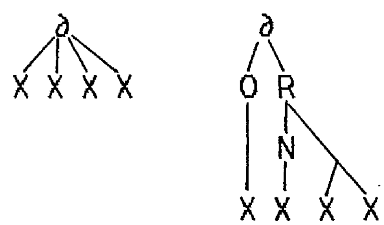
CVC

d)



CVVC

e)



CVCC

In the configurational template, the existence of three constituents is assumed: the onset (O), the rhyme (R) and the nucleus (N). The rhyme includes the nucleus and any slots following the nucleus, while the onset is the complement of this (McCarthy 1985:18). The traditional coda is dispensed with as a separate constituent: slots attached to the traditional coda branch directly from the rhyme node; for this model, it will be argued that the existence of a distinct coda constituent is redundant.

In considering the structure of the syllable template, it is necessary to enumerate areas in which the hierarchy of the syllable may be relevant. To this end, I shall examine the role of accentuation, then the role of collocational restrictions.

1.4.3. Accentuation:

The essential point is whether the rhyme of a syllable (i.e. the nucleus of the syllable and what follows) can be said to have internal structure in the dialects under consideration. In accentuation in some languages, the notion 'heavy' syllable embraces a disjunction of syllable types: namely a type containing a long vowel or a diphthong, and a type with a short vowel closed by a consonant (McCarthy 1979:443, 1985:78). While accentuation appears to be insensitive to the constituent composition of the rhyme for Classical Arabic (McCarthy 1979:446, 1985:127ff), it will be observed that this is not always the case for these dialects. In order to determine whether the rhyme has internal structure in these dialects, it is necessary to consider word-stress in a number of lexical items with differing syllable structure. Note that Diem claims that word-stress assignment appears to be identical in all Yemeni dialects and that, while stress may shift according to sentence rhythm, in most cases, assignment of word-stress is identical to that described by McCarthy for Classical Arabic (McCarthy 1979:461, Diem 1973:11, cf. also Rossi 1937:239), viz:

1.4.3.1.

a) Stress a superheavy ultima - CVVC/CVCC;

b) Otherwise stress the right-most non-final heavy syllable;

c) Otherwise stress the first syllable. (McCarthy 1979:460, 1985:127-8, Diem 1973:11)

Consider, however, stress in the following lexical items in the dialects in their utterance-final form:

1	'C V V C	'b e i t	'house' (Hub.)
		'b e e t	'house' (Kus./Gab.)
2	'C V C V C	'm a l i k	'king'
3	'C V C V C V	'b a q a r a	'cow'
3a	C V 'C V C C V C	b a 'q a r t u h	'his cow' (K./G.)
4	'C V C V C V C	's a l a T a t	'she dipped bread in 'salTa' (traditional Yemeni broth)' (K./G.)
5	'C V C V C V V	'r a S a d u w	'they m. wrote' (H.)
6	'C V V C V C	'g a a l i s	'sitting'
6a	'C V C C V C	'S a f f a r	'to brown s.th.'
		'm a f r a g	'qāt-chewing room'
7	C V 'C V V C	s a 'f i i r	'ambassador'
8	C V C 'C V V C	m a g 'n u u n	'mad'
8a	'C V V C V V C	'S a a b u u n	'soap'
		'd i i w a a n	'sitting room'
		'g i i z a a n	'J͡īzān' (city name)
9	C V 'C V V C V C	m u 'w a a T i n	'citizen, local m.'
9a	C V 'C V C C V C	m u 'x a z z i n	'qāt-chewer m.'
10	C V 'C V V C V C V V C	m u 'w a a T i n i i n	'citizens m.'
10a	C V C V C C V 'C V V C	m u x a z z i 'n i i n	'qāt-chewers m.'
11	C V C 'C V C C	? a b 'S a r k	'you m.s. saw'(Hub.)
12	C V 'C V C C	j i 'H i b b [1.]	'he loves'
13	C V 'C V V C V V C	m a 'f a a t i i H	'keys'
		s u 'l e i m a a n	'(name)' (Hub.)
14	C V 'C V V C V V C V C	? a 's a a m i i h u m	'their m. names'
15	'C V V C V C V V C	'ᶜ a a T i ʃ i i n	'thirsty m.pl.'

In continuous speech, word-stress is assigned as for individual lexical

1. Note that final geminates are always stressed despite utterance-final degemination. This indicates that word-stress is assigned prior to utterance-final degemination (cf. 7.3.2.1.).

items in the unmarked case. As noted by Diem and Rossi, word-stress may shift, however, according to sentence rhythm. Word-stress is more prone to shift in words containing more than one CVV syllable.

The significant lexical items are those which have a CVV syllable type in the same position as a CVC syllable type in a second lexical item - as in 6,6a, 8,8a, 9,9a, 10,10a. It is by observing the behaviour of these sets of pairs that we determine whether or not there is a disjunction between CVV and CVC syllables in terms of stress assignment.

The algorithm for stress assignment as detailed by Diem and McCarthy holds in all cases except those lexical items in which either two CVV syllables occur in the word (see 14), or one CVV syllable and one final CVVC occur (see 8a versus 8, 9 versus 9a and 10 versus 10a above). In these cases, it is not **the** right-most CVV or CVVC syllable that is stressed, rather it is the left-most, as in:

?a'saamiihum 'their m. names'

mu'waaTiniin 'citizens m.' v. muxazzi'niin 'qāt-chewers m.'

The stressing of the first of two CVV syllables in the word was also recorded by Behnstedt for the dialects of Sa^{c}da (Behnstedt 1987:17). This phenomenon appears to be peculiarly Yemeni and contrasts with all other recorded dialects of the Gulf, the Levant and Egypt in which the rule stressing an ultima superheavy syllable seems to hold in all cases (Ingham 1982, Glover, p.c., Holes, p.c., Broselow 1976, McCarthy 1985:118).

And so, while in many dialects of Arabic stress assignment needs to refer only to the number of slots in the rhyme, in these Yemeni dialects, in words containing two non-final heavy, or one heavy and one final superheavy syllable, there is a disjunction between CVV and CVC syllables.

This can only follow if the terminal points of syllables distinguish C from V, since reference to the number of X slots will not accomplish it. Therefore, while in other Arabic dialects CVC is heavy, in Yemeni it can be analysed as light. This disjunction can only be represented by means of a configurational syllable template. In order to account for the Yemeni case, the algorithm for stress assignment must be revised accordingly. Before this is done, however, another revision of the stress algorithm must be made here in order to account for certain processes of syncope in Kusmi and Gabiini. This is namely that when no heavy, or closed, syllable occurs in a word, it is not the left-most, rather it is the first <u>or</u> the antepenultimate syllable which receives stress (whichever is right-most). No words with more than three light open syllables in the word surface in any of the dialects considered here. When a morpheme with three light open syllables and a morpheme with one light open syllable are concatenated in Kusmi and Gabiini dialects, as in /xabazat+uh/ 'she baked it', or /baqara(t)+uh/ 'his cow', stress is assigned to the antepenultimate syllable and the stressless vowel is subject to syncope. Therefore, while <u>xabazat</u> 'she baked' is stressed as below:

'x a b a z a t 'she baked'

when a vowel-initial object pronoun is added, stress falls on the antepenultimate syllable and the stressless vowel is subject to syncope (cf. 6.3.2.1.1.1.), to give the following realisation:

x a 'b a z t u h 'she baked it' and (not *'x a b a z a t u h)

The stress algorithm is revised accordingly as in 1.4.3.2. below:

1.4.3.2.

a) Stress the left-most heavy (CVV) syllable in a word which has two heavy syllables or one heavy syllable and one superheavy ultima (CVVC);

b) Otherwise stress a superheavy ultima (CVVC/CVCC);

c) Otherwise stress the right-most non-final heavy or closed (CVC) syllable;

d) Otherwise stress the first (left-most) syllable or the antepenultimate syllable (whichever is right-most in the word).

1.4.3.3. Exceptions to the stress algorithm:

Prothetic vowels are never stressed. Thus, the definite article (when realised as [?al] in utterance-initial position) never receives stress, viz:

C V C 'C V C V C V   [?a l 'b a q a r   'the cows'

as opposed to:

*'C V C C V C V C V   ['?a l b a q a r

And epenthetically-inserted vowels are never stressed, as in the Hubaiʃi example:

'C V C C V C C V C   'g a b h [a] t h u m   'their forehead(s)'

as opposed to the unattested:

*C V C 'C V C C V C   g a b 'h [a] t h u m[1].

Let us now consider the other area in which the hierarchy of the syllable may be relevant.

1.4.4. Collocational constraints:

In the dialects, any consonant may occupy the onset slot of a syllable quite independently of the quality of vowel occupying the nucleus. However, while there are no collocational constraints operative between onset and nucleus, constraints do exist within the nucleus and within the rhyme.

1.4.4.1. Nucleus:

As far as the nucleus is concerned, durationally long vowels are permissible, but vowel sequences are restricted. In a template in which the nucleus (N) constitutes a distinct constituent, when the nucleus is

1. The argument for analysing this vowel as epenthetic in Hubaiʃi will be dealt with in detail in chapter six (6.3.1.3.1.).

linked to two X slots, these two X slots will either share a single feature matrix, or the feature matrix for /a/ is followed by the feature matrix for one of the high vowels - /i/ or /u/. These cases are illustrated below:

i. Long vowels:

```
   N
  / \
 X   X
  \ /
  [a]
```

h [a a] dh a a 'this m.' (Hub./Kus.)

h [a a] Dh a a 'this m.' (Gab.)

```
   N
  / \
 X   X
  \ /
  [i]
```

m u q a w w i t [i i] n 'qāt-dealers m.'

```
   N
  / \
 X   X
  \ /
  [u]
```

w u S [u u] l 'arrival' (verbal noun)

ii. Diphthongs.

When two X slots linked to distinct feature matrices are linked to the nucleus, the feature matrix for /a/ occupies the left-most slot and either the feature matrix for /i/ or the feature matrix for /u/ occupies the right-most slot, viz:

```
   N
  / \
 X   X
 |   |
 a  i/u
```

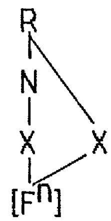
as in: b [a i] t 'house' S [a u] t 'sound, voice'[1].

No other possibilities exist, viz: *i w and *u j

1.4.4.2. Rhyme:

When a vowel is followed by a high glide, this glide either shares a single feature matrix with the vowel and occurs to the immediate left of an utterance-final boundary, or /a/ is followed by /w/ (and the word is monosyllabic) viz:

i.

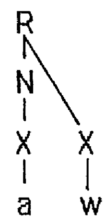


(where $[F^n]$ = all features)

as in: ? a b S a r [u w]] φ 'they m. saw'

? a b S a r n [i j]] φ 'he saw me'

ii.



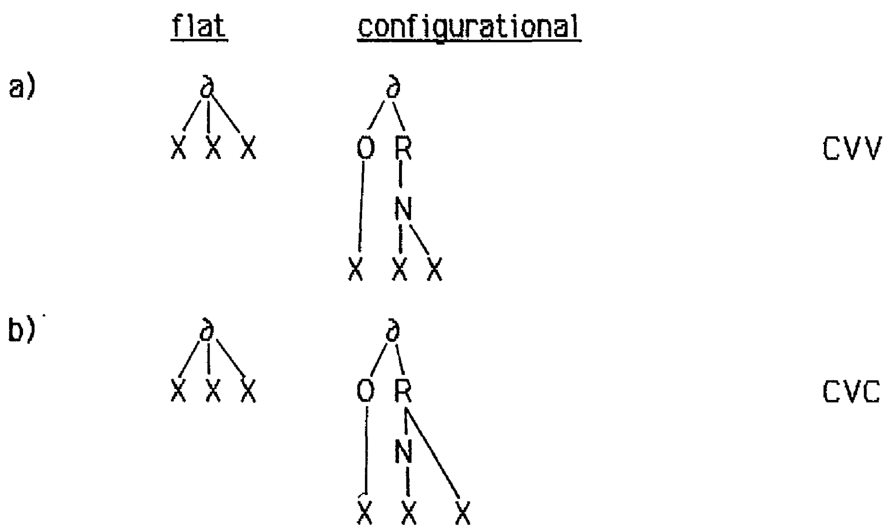
as in: l [a w] 'if'

The data suggest that collocational restrictions are operative both within the nucleus and within the rhyme. Selkirk, following Pike, observes that:

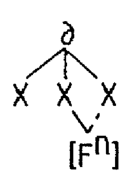
> 'the more closely related structurally (in the obvious sense), the more subject to phonotactic constraints that position slots are' (Selkirk 1982:339)

1. Monophthongisation subsequently occurs in Kusmi and Gabiini (cf.7.2.2.1.1.), while /a/ is the target of roundness ([+R]) or palatal ([+P]) spread in Hubaiʃi (cf.7.2.1.1.1.1.).

It is precisely these close structural relationships between components of the syllable that an adequate syllable template must be able to explicate. Returning to the syllable templates posited above, it is seen that, only by positing a configurational template, can the relationship between segments in the rhyme be illuminated. With the flat template, the syllable cannot be viewed as having internal structure, nor can it be represented as part of a higher order prosodic tree (Selkirk 1982:356). Since a flat template is unable to differentiate between a CVC syllable and a CVV syllable, as illustrated below:



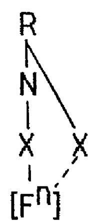
the flat template is similarly unable to handle the generalisation that two X slots linked to the nucleus must either share the same feature matrix, or the matrix for /a/ is followed by the matrix for /i/ or /u/ - any attempt to show this collocational restriction on the flat template flounders: the structure of the flat template automatically generalises this restriction as operative between any middle and final segments of the syllable. Consider the flat template below:



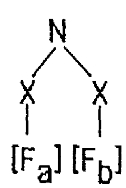
(where $[F^n]$ = all features)

Since there is 'no a priori way of determining whether or not the non-nuclear rime slot is [+syll]' (Levin 1983:18), this diagram does not differentiate [ij] or [uw] from [ii] or [uu]. The configurational template, on the other hand, is able to capture the generalisation, no more, no less: in case two segments are associated to a single nucleus, they are either linked to one feature matrix, viz:

and this is distinct from two slots of the rhyme being linked to a single feature matrix, viz:



or, the feature matrix for /a/, [F_a], is linked to the left-most slot and the feature matrix for /i/ or /u/, [F_b], is linked to the right-most slot, viz:



1.4.5. The minimal syllable:

Not only can the configurational template illustrate collocational restrictions, but also, it facilitates a statement concerning the minimal syllable: whereas, according to the flat syllable template, it is only possible to state that the minimal syllable within the utterance contains two slots at the level of zero projection, the configurational template establishes why the minimal syllable contains two slots: and that is precisely because an onset must precede a rhyme in every case, viz:

1.4.5.1.
```
O   R
|   |
X   X
```

And this, effectively, covers the negative condition on the juxtaposition of two rhyme-heads, viz:

1.4.5.2.
```
*R   R
 |   |
 N   N
 |   |
 X   X
```

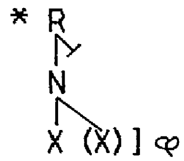
Importantly, the configurational template enables an expression of the minimal syllable in utterance-final position: while in the flat template there can be no distinction between the minimal utterance-final syllable, CVC, and the open syllable, CVV, which is impermissible in this position, viz:

```
    ∂
   /|\
  X X X   i.e. CVV/CVC
```

the configurational template establishes that the minimal syllable in utterance-final position contains a branching rhyme, viz:

1.4.5.3.
```
R
|
N\
|  \
X   X ]φ
```

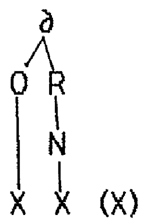
and, that it is precisely a non-branching rhyme which is ruled out in this position, viz:

1.4.5.4. 

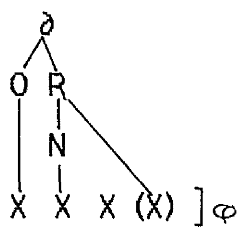
1.4.6. The syllable template for the dialects:

The syllable templates forwarded for the dialects are as below:

i. Non-utterance-final position:



ii. Utterance-final position:



These illustrate that:

i. in non-utterance-final position the minimal syllable for the language comprises an onset and a nucleus (CV), and that the maximal syllable comprises three slots at the level of zero-projection; the third and bracketed slot (X) may be associated to either the nuclear or the rhyme node;

ii. in utterance-final position, the minimal syllable for the language comprises three slots at the level of zero projection: an onset, a nucleus and a slot associated directly with the rhyme (CVC), and that the maximal syllable comprises four slots (CVCC or CVVC).

1.4.7. Syllable constituents and hierarchy within the syllable:

The configurational template also mirrors observations regarding the sonority hierarchy within the syllable which are reflected in the order of associating constituents to segments. The Liberman and Prince algorithm is given as: peak (1), onset (2), coda (3) (cf. Liberman and Prince 1977:259, cited in Selkirk 1982:343, and cf. Hooper 1976:199). The peak is either generally present on the morphological template, as in these dialects, or is assigned prior to the onset. The onset is obligatory and is assigned at the first stage of syllabification in accordance with the 'Onset First Principle' (cf. Hooper 1976:220). The syllable constituents forwarded in this model are onset, rhyme and nucleus. It is felt that the independent constituent coda is unnecessary - on the one hand, it would suggest that the coda enjoyed a similar status to the other three constituents, and, on the other hand, the positing of an independent constituent coda would fail to illuminate the dependency relations between nuclear and non-nuclear elements of the rhyme. Slot(s) linked to the traditional coda are linked directly to the rhyme in this model.

In the configurational template posited above (1.4.6.), the rhyme is shown to be stronger than the onset since it directly dominates nuclear slots together with any slot to the right of the nucleus; in contrast to the onset, the rhyme may contain more than one slot in its domain in these dialects. And as observed above, many phonological processes - such as word-stress assignment and utterance-final phenomena - refer to the rhyme, and are sensitive to rhyme weight, but are insensitive to the onset.

Positive statements we can forward so far in regard to syllable structure in the dialects are:

a) An onset must precede every rhyme: the minimal syllable is CV.

b) Onsets are non-branching.

c) No constituent is linked to more than two slots at the level of zero-projection.

d) Skeletal slots linked to a branching nucleus must either share the same feature matrix, or the left-most slot is linked to the matrix for /a/ and the right-most slot is linked to the matrix for /i/ or /u/.

e) When a branching rhyme contains a high glide, either, the matrix for /a/ associates with the nuclear slot, or, in utterance-final position, the glide shares the feature matrix associated with the nuclear slot.

f) In utterance-final position, non-branching rhymes are ruled out.

1.5. Syllabification:

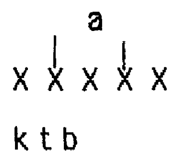
The inventory of permissible syllables has been determined; collocational restrictions have been established; and, in the light of necessary generalisations, the syllable template has been posited. I can now continue to consider an algorithm for syllabification.

The output of syllabification must abide by the Well-formedness Condition for syllabification:

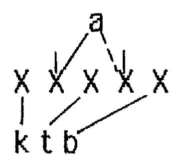
1.5.1. Well-formedness Condition:

> 'Within a syntactic domain specified for the language, the syllabic structure of the representation must be <u>non-distinct</u> from the template.' (Selkirk 1982:345)

The input to syllabification is not a sequence of unlabelled X's in the present case. Yemeni dialects, in common with (probably) all Semitic languages, are template supplying languages and have partially syllabified morphemes (cf. 0.4.1.2.2.). In template supplying languages, skeletal templates are posited to which rhyme-heads are already attached, viz:



Given this partially-syllabified phonological string, association applies in accordance with the Universal Association Conventions (cf. 0.4.1.1.2.1.), as below:



Syllabification then proceeds from left-to-right assigning the onset then linking the remaining slot to the rhyme to give a fully syllabified output of:

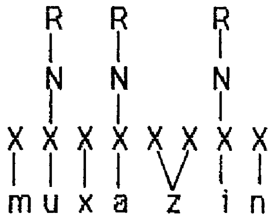
.k a .t a b. 'he wrote'

Syllabification in the dialects adheres to the Maximal Syllable Onset Principle, as below:

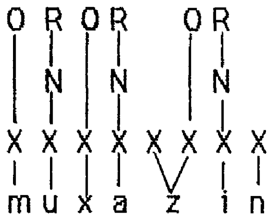
1.5.2. Maximal Syllable Onset Principle

> In the syllable structure of an utterance, the onsets of syllables are maximised, in conference with the principles of basic syllable composition of the language. (Selkirk 1982:359, and cf. Hooper 1976:190, 220 etc.)

This means that when a word-medial consonantal slot may be analysed as either being linked directly to the rhyme, or, being linked to the onset, the Maximal Syllable Onset Principle prevails to link the slot to the onset. Consider the syllabification of muxazzin 'qāt-chewer m.':

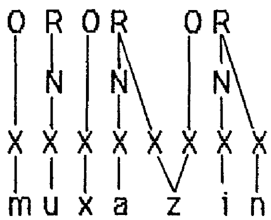


1.5.3. Syllable formation: (assignment of onsets)



Rhyme branching applies to link any slots to the rhyme which have not been not covered by syllable formation:

1.5.4. Rhyme branching:



This gives the output: .m u .x a z .z i n. 'qāt-chewer m.'

1.6. Resyllabification:

Before considering processes which conspire to preserve syllable structure and syllable repair processes, I shall examine the process of resyllabification whereby a syllable final consonant is resyllabified as the onset of the succeeding syllable following deletion of a laryngeal consonant. Since deletion of laryngeals in the immediate environment of a consonant (which is not /h/ or /?/) is a persistent phenomenon in the grammars of Hubaiʃi, Gabiini and Kusmi, it is necessary to examine and formalise this process. Resyllabification necessarily follows the Principle of Syllable Structure Preservation, stated below:

Principle of Syllable Structure Preservation:

> The derived syllable structure produced by rules of resyllabification must conform to the syllable template of the language. (Selkirk 1982:368)

Consider the process of resyllabification as exemplified in the following cases:

1.6.1. Hubaiʃi:

1.6.1.1. Laryngeal disassociation and resyllabification:

In Hubaiʃi, initial /h/ of the demonstratives, locatives and the independent pronouns is disassociated to the left of a consonant-final word, as in the examples:

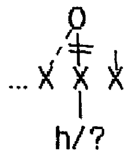
/m i n + h u u n a/	-->	.m i .n u u .n a.	'from here'
/m a n + h a a dh a a/	-->	.m a .n a a .dh a a.	'who is that m.s.?'
/m a n + h a a dh i i/	-->	.m a .n a a .dh i i.	'who is that f.s.?'
/? a i n + h i/	-->	.? e i .n i.	'where is she?'
/? a i n + h u/	-->	.? e i .n u.	'where is he?'

Also, initial /?/ is disassociated to the left of a consonant, as in the examples:

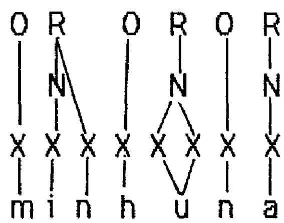
/m a n + ? a n t a/	--->	. m a . n a n . t a .	'who are you m.s.?'
/m i n + ? a g l + u/	--->	. m i . n a g . l u .	'for his sake'

Laryngeal disassociation is formalised as disassociation of the laryngeal consonant and reassociation of the onset with the adjacent consonant.

1.6.1.1.1. Laryngeal disassociation:



Laryngeal disassociation and resyllabification is illustrated in the syntactic concatenation of /m i n + h u u n a/ below:

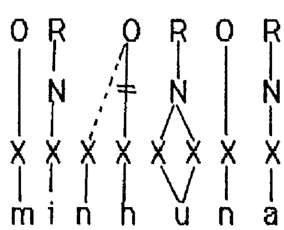


The consonant, (/n/), is linked to the right-hand branch of the rhyme in the input. Unless laryngeal disassociation follows, this would produce the fully syllabified output below:

. m i n . h u u . n a .   'from here'

However, in this instance, laryngeal disassociation and resyllabification take place as below:

Laryngeal disassociation and resyllabification:



Resyllabified output:

. m i . n u u . n a 'from here'

The disassociated slot falls away and the slot attached previously to the right-hand branch of the rhyme is resyllabified with the onset of the succeeding syllable.

1.6.2. Kusmi and Gabiini:

Since laryngeal disassociation and resyllabification affect these two dialects similarly, I shall consider Kusmi and Gabiini together.

1.6.2.1. /h/ disassociation and resyllabification:

In Hubaiʃi, laryngeal disassociation affects not only /?/, but also initial /h/ of the demonstratives and the locatives in addition to initial /h/ of the independent pronouns; in Kusmi and Gabiini, however, /h/ of the demonstratives and the locatives is generally retained in context, as in:

m a n [h] a a dh a a	'who is that m.?'	(Kus.)
m a n [h] a a Dh a a	'who is that m.?'	(Gab.)
m i n [h] a a n a	'from here'	

When /h/ is the initial element of the (third singular) independent pronouns, however, disassociation does frequently occur to the immediate left of a consonant and resyllabification applies, as illustrated below:

/m a n + h u/	--->	. m a . n u .	'who is he?'
/m a n + h i/	--->	. m a . n i .	'who is she?'
/? a i n + h i/	--->	. ? e e . n i .	'where is she?'
/? a i n + h i/	--->	. ? e e . n i .	'where is he?'

Disassociation and subsequent resyllabification are also attested when

/h/ constitutes the initial element of the (third plural) independent pronouns, as in:

/m a n + h u m/ --->	. m a . n u m .	'who are they m.?'
/m a n + h a n/ --->	. m a . n a n .	'who are they f.?'

But not where the above forms are suffixed as object pronouns to a verbal form or as possessive determiners to a nominal form, as in:

Dh a r a b [h] u m	'he hit them m.'	b i n t (u) [h] u m	'their m. girl'
Dh a r a b a t [h] a n	'she hit them f.'	b i n t (a) [h] a n	'their f. girl'

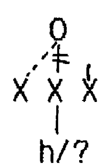
1.6.2.2. /?/ disassociation and resyllabification:

While resyllabification involving the disassociation of initial /h/ is generally restricted to third person independent pronouns in Kusmi and Gabiini, the disassociation of /?/ followed by resyllabification appears to be as prevalent in Kusmi and Gabiini as in Hubaiʃi, as in:

/m a n + ? a n t a/ --->	. m a . n a n . t a .	'who are you m.s.?'
/m i n + ? a g l + u h/ --->	. m i . n a g . l u h .	'for his sake'
/m a n + ? a^{C} g a b + u h/ -->	. m a . n a^{C} . g a . b u h .	'who pleased him?'

Formalisation of laryngeal disassociation and resyllabification in these dialects is formalised below as in 1.6.1.1.1. with the added restriction:

1.6.2.3. Laryngeal disassociation:



(if the disassociated segment is /h/, /h/ is the initial element of a (third) independent pronoun)

In all instances, the resultant resyllabified string conforms to the Principle of Syllable Structure Preservation: resyllabification enables one permissible syllable configuration to be replaced only by a second permissible configuration.[1] Implications of resyllabification will be taken up again in chapter three.

1.7. Structure-preserving processes:

I shall finally examine processes invoked in the dialects to deal with unsyllabified elements.

1.7.1. CC in initial position:

Extra-syllabic elements are permitted in initial position in the dialects only in case an initial consonant sequence comprises:

	sibilant + stop	s k u t!	'shut up m.s.!'
or	obstruent + liquid	g l i s!	'sit m.s.!'
		s l i m i i	'I've had enough'

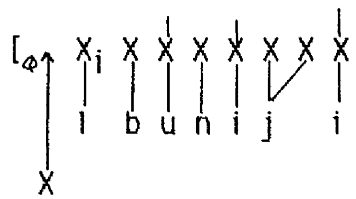
When a morpheme with any other initial consonant cluster occurs in utterance-initial position, the extra-syllabic consonant triggers prothesis of a rhyme-headed X slot (vowel prothesis). Consider the affixation of thedefinite article, which is analysed in the present study as /l/, to a noun:

/l + b u n i j j i/	'the girl' (Hub.)
/l + m i l q a a T/	'the tongs (used to take coals to the water pipe)'

The presence of the extra-syllabic clitic triggers vowel prothesis which in turn triggers consonant prothesis, as below:

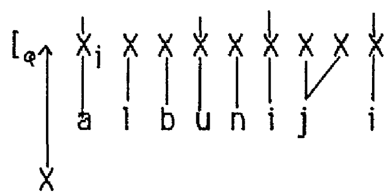
1. Note that I am not concerned with syllables attested at the phonetic level which may not be those motivated at the phonological level and which therefore need not conform to the above description (cf. A.2. in the Appendix).

1.7.1.1. Vowel prothesis:

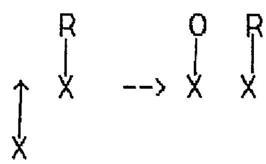


The minimal syllable attested is CV; vowel prothesis has therefore created a second impermissible sequence. The unsyllabified vowel triggers prothesis of a non-rhyme-headed X slot (consonant prothesis):

1.7.1.2. Consonant prothesis:



Prothesis of a non-rhyme-headed X slot is seen as an instance of syllable formation observed above (cf. 1.5.3.), viz:

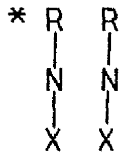


The form is realised as: [$_\Phi$[? a] l b u n i j j i 'the girl'

1.7.2.Concatenation of vowel-final and vowel-initial morphemes:

1.7.2.1. Rhyme disassociation:

The minimal syllable is CV. In case a final CV sequence should juxtapose an initial VC sequence in these dialects, three processes conspire to preserve structure: deletion of one of the vowels, complex consonant formation, or consonant epenthesis. Since every syllable must possess an onset, no syllable begins with a rhyme and so, a sequence of two rhymes is ruled out. Consider the negative condition, repeated below for convenience:



(cf. 1.4.5.2.)

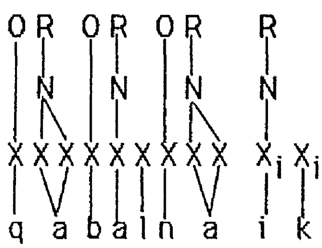
1.7.2.1.1. Hubaiʃi:

The [second feminine singular] object pronoun is /ik/ in Hubaiʃi. The [first plural] subject or object pronominal suffix is /naa/. When the two pronouns are concatenated, as in: '<u>We</u> met <u>you (f.s.)</u>', the following process occurs:

input:

/q a a b a l n a a + i k/

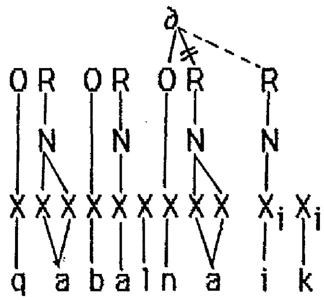
This appears on the skeletal template as:



This gives an impermissible sequence of two vowels. In this case, the process invoked is that of rhyme disassociation. The unsyllabified clitic triggers disassociation of R_i:

R_i disassociation:

This affects the example as below:



This is realised as the fully syllabified:

.q a a .b a l .n i k. 'we met you (f.s.)'

1.7.2.1.2. Hubaiʃi, Kusmi and Gabiini:

In all three dialects, when the interrogative marker /maa/ (Kusmi and Gabiini) or /muu/ (Hubaiʃi) precedes a vowel-initial morpheme, the unsyllabified element triggers disassociation of R_i. (In Hubaiʃi, note that the feature matrix associated with R_i reassociates after disassociation of R_i with the adjacent labial consonant to produce the complex consonant $[m^w]$):

/m u u + i s m i k/ ---> $[m^w]$ [i] s m i k 'what is your f.s. name?' (Hub.)

and

/m a a + i s m i k/ ---> m [i] s m i k 'what is your f.s. name?' (Gab./Kus.)

1.7.2.2. Complex consonant formation:

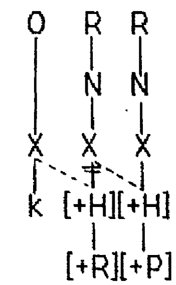
1.7.2.2.1. Hubaiʃi:

In Hubaiʃi, when the [first singular] subject pronoun (/ku/) precedes the [second feminine singular] (/ik/) or [third feminine singular] (/i/) object pronoun, a process of complex consonant formation is invoked. As proposed in the Introduction, I assume that complex consonant formation involves disassociation of the vocalic feature matrix and reassociation of the matrix with the slot of the preceding ([+high]) consonant (cf. 0.4.1.5.3.4.). In the present case the consonant (/k/) is thereby labialised and rounded. In phonological word-final position – i.e. when the (feminine singular) object pronoun is final in the phonological word – R_i is not disassociated (as in the instance of /muu+ismik/ given above) – but rather, R_i remains. The feature matrix of R_{ii} subsequently spreads to associate with the empty rhyme-headed X slot, viz:

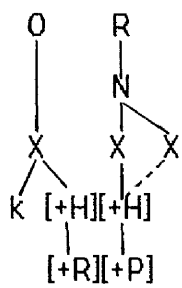
/? a b S a r k u + i k/	--->	? a b S a r [k^w] i i k	'I saw you f.s.'
/? a b S a r k u + i/	--->	? a b S a r [k^w] i i	'I saw her'

This process is formalised in abbreviated form as below (cf. 0.4.1.5.3.4.):

Complex consonant formation:



The Obligatory Contour Principle subsequently brings about simplification to:



Complex consonant formation also applies in Hubaiʃi when the (third masculine plural) subject pronoun precedes a (feminine singular) object pronoun if the final root consonant is roundable (the roundable consonants in this dialect are /m/, /b/, /f/ or /k/ - i.e. either [+labial] or [+high]):

/j i s a m m u u + i k/	--->	j i s a m [m^W] i i k	'they call you f.s.'
/j i s a m m u u + i/	--->	j i s a m [m^W] i i	'they call her'

When /?abu/ precedes a [feminine singular] possessive determiner, complex consonant formation similarly affects /b/, viz:

/? a b u + i k/	--->	? a [b^W] i i k	'your f.s. father'
/? a b u + i/	--->	? a [b^W] i i	'her father'

Note that complex consonant formation is a post-lexical process and is not dependent on morphological information. It invariably occurs in the case of the [first singular] subject pronoun because the consonant (/k/) is high ([+high]) and, therefore, labialisable and roundable. As seen above, complex consonant formation applies when /muu/ occurs to the right of a morpheme with an initial /i/. The process only occurs in the case of the [third masculine plural] subject pronoun when the final consonant of the verbal stem is roundable (and cf. 2.4.1.1.).

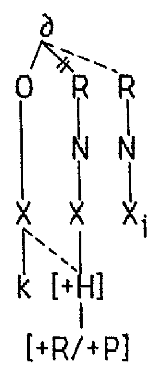
1.7.2.2.2. Kusmi:

Complex consonant formation is also attested in Kusmi when a vowel-final and a vowel-initial morpheme are concatenated. Labialisation occurs in this dialect, not only when the affixed morpheme is /i/ initial, but also when the affixed morpheme is /a/ initial. In addition, complex consonant formation applies in Kusmi, not only when the disassociated feature matrix of a [+round] vowel labialises and rounds an adjacent roundable consonant (as in the [first singular] subject pronoun in the perfect aspect of the verb), but also when the disassociated feature matrix of a [+palatal] vowel palatalises an adjacent palatalisable consonant (as in the case of [feminine singular] and [second feminine singular] subject and object pronouns). In contrast to Hubaiʃi, R_i disassociation does occur when the affixed morpheme is final in the phonological word in Kusmi, and it is the feature matrix of disassociated R_i which enters into complex consonant formation. The following forms are attested:

/q a t a l + k u + a h/	-->	q a t a l [k^w] a h	'I killed her'
/q a t a l + k i + a k/	-->	q a t a l [tʃ] a k	'you f.s. killed you m.s.'
/ʃ i m i h + k i + u h/	-->	ʃ i m i h [tʃ] u h	'you f.s. saw him'

R_i disassociation and complex consonant formation in these cases is diagrammed in abbreviated form as below (and cf. 0.4.1.5.3.4.):

1.7.2.2.2.1. R_i disassociation and complex consonant formation:

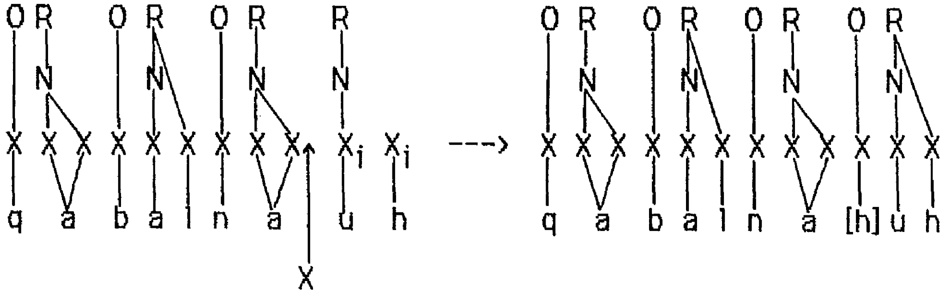


1.7.2.3. Consonant epenthesis:

The final process available in case a vowel-final and a vowel-initial morpheme are concatenated is epenthesis of a non-rhyme-headed X slot (consonant epenthesis). Of the processes mentioned, this is the least commonly invoked.

1.7.2.3.1. In Kusmi and Gabiini, when a vowel-initial object pronoun ([third singular]) is suffixed to the vowel-final [first plural] subject pronoun, syllabification proceeds and the unsyllabified vowel triggers insertion of a non-rhyme-headed X slot with which [h] subsequently associates, viz:

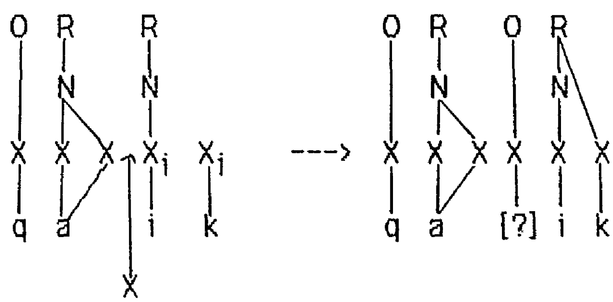
Consonant epenthesis:



to realise: . q a a . b a l . n a a . [h] u h . 'we met him'

1.7.2.3.2. In Hubaiʃi, as in most other Yemeni dialects, a reflex of the Arabic corroborative particle, qad, is available. In contrast to Classical Arabic and Modern Standard Arabic, the particle does not directly precede the verb, but is cliticised either to the independent pronouns, or to the possessive determiner. The representation of the Hubaiʃi corroborative particle is /qaa/ (in Kusmi and Gabiini the representation of the particle is /qad/). When the Hubaiʃi particle precedes a vowel-initial possessive determiner - eg. /ik/, (second feminine singular), or /ak/, (second masculine singular) - the unsyllabified vowel triggers epenthesis of a non-rhyme-headed X slot with which [?] subsequently associates, viz:

Consonant epenthesis:



to realise: .q a a .? i k. 'you f.s. . . . '

1.7.2.3.3. Finally, in all three dialects (vowel and) consonant epenthesis across words can occur when the affected morpheme is given emphasis. This affects imperative forms in particular, as in:

/q u u l i i + s k u t/	q u u l i i [ʔ] u s k u t	'say f.s. 'shut up!''

1.7.3. Concatenation of final (V)CC and initial CV morphemes:

Consider the repair processes of vowel epenthesis and of laryngeal disassociation available in case a medial string of three consonants should arise.

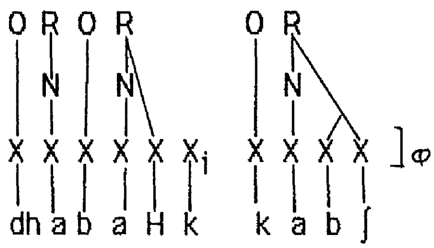
1.7.3.1. Vowel epenthesis:

In non-utterance-final position, no more than two slots are linked to the rhyme. In case a morpheme containing two final consonants should juxtapose a consonant-initial morpheme, the right-most consonant in the initial morpheme remains unsyllabified.

1.7.3.1.1. When a morpheme ending in two consonants and a consonant-initial morpheme are concatenated within the phonological word the only process available in all three dialects is insertion of a rhyme-headed X slot (with which it is subsequently associated either by [a] or by [u], cf. 2.4.2.1.1.1. and 2.4.2.2.1.), as illustrated below:

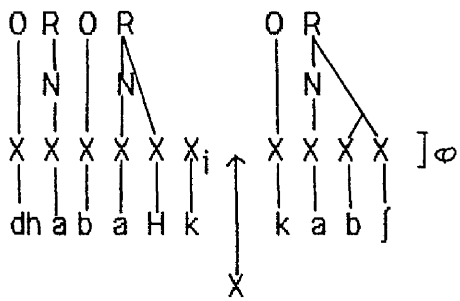
/b a i t + k u m/	-->	b e i t [u] k u m	'your m. pl. house' (Hub.)
/b a i t + h u m/	-->	b e e t [u] h u m	'their m. pl. house' (K./G.)
/ʃ i m i h k + n a a/	-->	ʃ i m i h k [a] n a a	'you m.s. saw us'

1.7.3.1.2. When, however, a phonological word ending in two consonants and a consonant-initial phonological word are concatenated, two processes are available to repair structure: either a consonant is deleted, or the unsyllabified consonant triggers insertion of a rhyme-headed X slot. Of these two processes, consonant deletion occurs (by means of laryngeal disassociation) if and only if the deletable consonant is a laryngeal. In all other cases, vowel epenthesis occurs. Consider vowel epenthesis in the case of dhabaHk[a]kabʃ 'you m.s. slaughtered a sheep', which is attested in all three dialects:

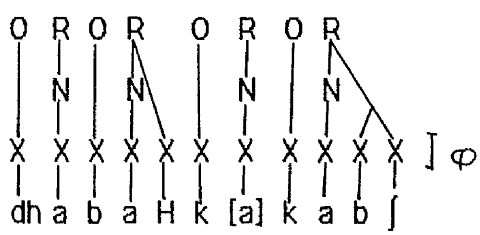


The unsyllabified consonant triggers insertion of a rhyme-headed X slot:

Vowel epenthesis:



[a] subsequently associates with the inserted rhyme-headed X slot and syllabification proceeds to produce an output which accords with the syllable template of the language:

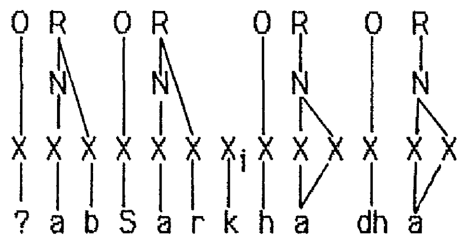


This yields:

.dh a .b a H .k a .k a b ʃ. 'you m.s slaughtered a sheep'

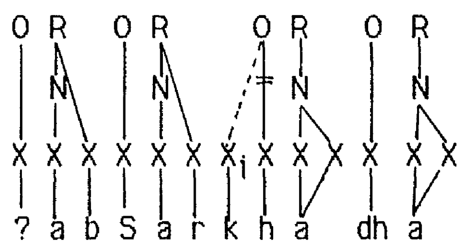
1.7.3.2. Laryngeal disassociation:

In case a demonstrative or a word with initial /?/ occurs to the right of a word ending in two consonants in Hubaiʃi, the unsyllabified consonant triggers laryngeal disassociation; and, similarly, in case the consonant to the right of a consonant sequence is /?/ in the Raimi dialects, the unsyllabified consonant triggers laryngeal disassociation. Consider the following derivation of ?abSarkaadhaa 'you m.s. saw this m.' in Hubaiʃi:



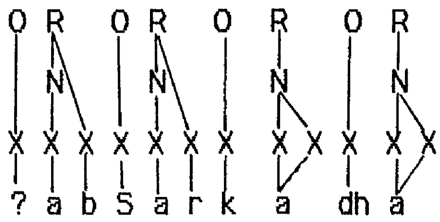
Since the CVCC syllable type is restricted to utterance-final position, /k/ is unsyllabified. In order to preserve structure, the unsyllabified consonant triggers disassociation of the laryngeal fricative, and the unsyllabified consonant is accommodated, as below:

Laryngeal disassociation:



Syllabification proceeds, as below:

Syllabification:

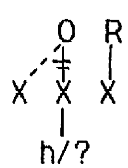


The unattached onset reassociates with the previously unsyllabified consonant to produce a sequence which is non-distinct from the syllable template for the language:

.? a b .S a r . k a a .dh a a. 'you m.s. saw this m.' (Hub.)

It will be noted that the process operative in this environment is identical to that mentioned above for resyllabification. Disassociation of the laryngeal triggered by an unsyllabified consonant, as in this case, however, is a repair process and enables two birds to be killed: i) the lost onset consonant is replaced; ii) the unsyllabified consonant is accommodated. The formulation of laryngeal disassociation and resyllabification is generalised to account for this instance of laryngeal disassociation, as below:

Laryngeal disassociation:



Further implications of processes which conspire to preserve and repair syllable structure will be broached in chapters two and three.

CHAPTER TWO

Glides, the Vocalic tier and Vocalic Features

In this chapter, I shall examine what is necessarily present on the vocalic tier in terms of vocalic features and feature-values for vowels in the dialects of Hubaiʃi, Gabiini and Kusmi.

As an initial point of departure, the problem of glides will be considered in terms of their relationship with vowels and their corresponding representation in the light of syllable and phrase-structure constraints. An important part of this section concerns the representation of the laryngeals - the glottal stop ,'ʔ', and the laryngeal fricative, 'h'. It is seen that features in the vocalic matrix must be able to illuminate the relationship between vowels and glides, and must distinguish, at some level, every segment. The choice of vocalic features will be discussed and determined. In the light of the Feature Minimization Principle, I shall then examine the way in which the set of vocalic features posited are made use of on the consonantal tier.

Having determined the identity of vocalic features, I shall discuss the identification of distinctive features and distinctive feature-values in the underlying vocalic matrix; whether or not a certain feature or feature-value is distinctive will be seen to be partially dependent on identification of the minimal vowel in the language system; this will be referred to as the non-specified vowel (NSV). It will be seen that postulation of the appropriate matrix is not determined universally, but is dependent on principles which interact with details of the particular language system. It is suggested that the identity of relevant vocalic features is language particular, for two language systems with identical vowel phoneme inventories may differ in the NSV and may require different inventories of vocalic features. They may similarly share the

NSV, yet differ in terms of vocalic features - either if the vocalic inventory is different, or processes operating are different. While the dialects under investigation do share the same non-specified vowel and vocalic matrix, it will, nevertheless, be suggested that a difference in features and feature-values specified in the underlying vocalic matrix is one way in which dialectal variation may manifest itself.

2.1. The representation of glides:

Consonants are represented on the consonantal tier; vowels are represented on the vocalic tier. To which tier and by which features should those segments which are traditionally assigned to neither the consonantal nor the vocalic class be represented underlyingly? SPE recognises six classes of sounds of which glides constitute one. Lass suggests:

> 'This is dubious on both phonetic and phonological grounds: the classification I adopt here does not recognise glides as an independent category, but takes [j,w] as either consonants (usually liquids) or vowels, depending on the circumstances.' (Lass 1984:83)

In Arabic, the glides /w/ and /j/ are frequently assigned to the consonantal tier owing to their distributional qualities (McCarthy 1981:386, 1985:258-9, 302), as in the Classical Arabic examples:

```
        |         |
   X    X    X    X    X
   |    |    |    |    |
  [w]   a    S    a    l        'he arrived'
```

and

```
        |              |
   X    X    X    X    X    X
   |    |    |    |    |    |
  [j]   a    k    t    u    b   'he writes'
```

However, underlyingly represented glides come to be frequently associated with a nuclear slot and realised as syllabic in certain phonological environments in Arabic - eg. to the left of a consonant - as in the Classical Arabic examples below:

root					
/b j t/	--> b a [i] t	'house'	v.	b u [j] u u t	'houses'
/s j r/	--> s i [i] r a	'way of life'	v.	s i [j] a r	'ways of life'
/q w m/	--> q a [u] m	'tribe'	v.	? a q [w] a a m	'tribes'
/q w ʃ/	--> q u [u] ʃ	'girth'	v.	? a q [w] a a ʃ	'girths'

In her work on underspecification, Archangeli assigns the Yawelmani glides /j,w/ to the consonantal tier and affords glides and vowels non-identical underlying representations (Archangeli 1984a:13). In what follows, I shall demonstrate that just as glides which form part of the root consonantism in the dialects of Hubaiʃi, Kusmi and Gabiini are represented underlyingly on the consonantal tier and may be realised as syllabic in certain phonological environments, so surface glides may be represented on the vocalic tier underlyingly and may be derived by means of phonological rule.

The second question concerning glides is feature specification. By which features should glides be specified? The inherent language dependency of underspecification allows, and, indeed, encourages different languages to provide different (but not contradictory) feature specifications for the 'same' segments. Should the underlying representations of /j,w/ be identical to the underlying representation of the vowels /i,u/ in these dialects? As Archangeli remarks:

> 'In languages as diverse as Yawelmani, Berber and Sinhalese there is motivation for non-identical representations: in a language like Spanish or Klamath,

however, there is a glide/high vowel alternation which suggests that in these languages the two have the same underlying representation.' (Archangeli 1984a:102)

As a means of determining the representation of glides in relation to vowels, I shall examine the treatment of vowels in utterance-final position. Note that while it is the treatment of long vowels in utterance-final position which is most pertinent in considering the relationship between vowels and glides, the treatment of short vowels will also be examined here.

2.1.1. Utterance-final phenomena:

In the dialects of Yemeni Arabic under consideration, no non-branching rhyme occurs in utterance-final position. The configurational representation of this negative condition is repeated below for convenience:

* R
N
X (X)]φ (cf. 1.4.5.4.)

This constraint as it concerns final short vowels is not restricted to Yemeni dialects, nor indeed to modern dialects of Arabic (cf. Wright 1971:368, Beeston 1970:21); when a morpheme with a final short vowel occurs in pause in Classical Arabic, four processes are generally said to conspire against the realisation of a short vowel in utterance-final position; these include: '?iskaan' - deletion, 'raum' - devoicing, '?iʃmaam' - which I interpret here as complex consonant formation, and the suffixation of [h] - known as 'haa? al-waqf' or 'haa? al-sakt', the [h] of pause or of silence (Birkeland 1940:9, Zamakhshari 1879:160-2). Morpheme final long vowels may be glottalised in pause in Classical Arabic (cf. Weil 1905/6:24, Lisān 1:11, Zamakhshari 1879:162.5).

2.1.1.1. Final short vowels:

In Hubaiʃi, Kusmi and Gabiini, when a morpheme with a final short vowel occurs in utterance-final position, two principal processes conspire to prevent the occurrence of an utterance-final vowel: the unsyllabified vowel is either deleted by means of bare nucleus deletion, or it triggers epenthesis of a non-rhyme-headed X slot. Where it is subject to bare nucleus deletion, feature disassociation may occur prior to deletion, and, in Kusmi, complex consonant formation applies.

2.1.1.1.1. Bare nucleus deletion:

Bare nucleus deletion - a reflex of the Classical Arabic process '?iskaan' - involves delinking a final rhyme-headed X slot. This process is synchronic in these Yemeni dialects and occurs in utterance-final position following vocalic feature disassociation in Hubaiʃi and complex consonant formation in Kusmi. Bare nucleus deletion is diagrammed below:

Bare nucleus deletion:

$$\begin{array}{l} R \\ | \\ N \\ \nmid \\ X\ ]_{\varphi} \end{array}$$

2.1.1.1.1.1. Vocalic feature disassociation:

In Hubaiʃi, features of the round vowel of the (first singular) perfective inflection are disassociated when this form is final in the phonological word (and reassociate with the right-most stem vowel), viz:

/k a t a b + k u/ is realised as k a t [u] b k $]_W$ 'I wrote' plus other rules. Note that this is a lexical process which depends on the information [first singular] (cf. 8.4.3.3.1.).

In utterance-final position, the empty $\overset{|}{X}$ slot is subject to bare nucleus deletion.

2.1.1.1.1.2. Complex consonant formation:

In Kusmi, when a morpheme ends in /u/ or /i/ and the adjacent consonant is roundable or palatalisable, the feature matrix of the vowel is disassociated and reassociates leftwards with the slot of the adjacent consonant, thereby becoming part of complex consonant formation (0.4.1.5.3.4. and cf.1.7.2.2.) - what I asume here to be a reflex of the Classical Arabic process, '?iʃmaam'. In intervocalic position, complex consonant formation affects a roundable consonant in Hubaiʃi when the final vowel of a morpheme is /u/ and the initial vowel of the suffixed morpheme is /i/, as seen above (cf.1.7.2.2.1.). Complex consonant formation is precluded in phonological word-final position in Hubaiʃi. In Kusmi, however, complex consonant formation does occur in phonological word-final position as well as in intervocalic position. In phonological word-final position, the [first singular] perfective subject pronoun in Kusmi is usually realised -[k^W] $]_W$, as in:

q a t a l [k^W] $]_W$ 'I killed'

This complex realisation contrasts with [ku] in non-phonological word-final position, viz:

m a a q a t a l [k u] ʃ 'I didn't kill'

In utterance-final position, the resulting empty rhyme-headed $\overset{|}{X}$ slot is subject to bare nucleus deletion.

While ?iʃmaam is said to apply to final /u/ only in Classical Arabic

(Birkeland 1940:7), complex consonant formation is not restricted to final /u/ in Kusmi. It appears that various palatalised forms of the (second feminine singular) subject pronoun and object pronoun/possessive determiner in Kusmi result from complex consonant formation in phonological word-final position, viz:

/k i/ ---> $[k_j]/[tʃ]\ ]_W$

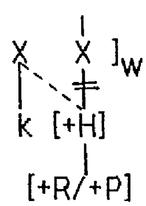
as in: /ʃ i m i h + k i/ ---> ʃ i m i h $[tʃ]/[k_j]\ ]_W$ 'you f.s. saw'

This contrasts with the non-phonological word-final realisation, [ki] (or [kii] before an ultimate suffix):

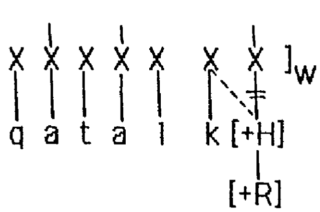
/m a a + ʃ i m i h + k i + ʃ/ --> m a a ʃ i m i h [k i i] ʃ 'you didn't see'

Complex consonant formation is formalised as disassociation of the feature matrix associated with the final vowel and consequent reassociation of the matrix with the adjacent ([+high] and therefore roundable or palatalisable) consonant. It is diagrammed here in abbreviated form (however, cf. 0.4.1.5.3.4.), viz:

Complex consonant formation:



This affects the (first singular) example given above as below:



---> q a t a l $[k^W]\ ]_W$ 'I killed'

This is a post-lexical process which results in violation of structure since neither palatalised [k_j]/[tʃ] nor labialised [k^w] constitute phonemes of the language (cf. 0.4.1.3.,3)). In utterance-final position, the empty rhyme-headed X slot is then subject to bare nucleus deletion (cf. 2.1.1.1.1.).

2.1.1.1.1.3. Coalescence:

Note that in Gabiini, /ʃ/ of the (second feminine singular) subject and object pronouns and the possessive determiner appears to have resulted historically from the coalescence of */ki/ in utterance-final position. Coalescence has since entered the lexicon in Gabiini: structure is not violated since /ʃ/ does constitute a phoneme of the language, viz:

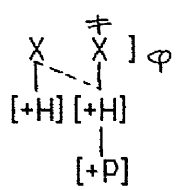
*/k i/ ---> /ʃ/

as in:

ʃ i m i h [ʃ] $]_W$ 'you f.s. saw' m a a ʃ i m i h [ʃ] a n i i ʃ 'you didn't see me'

Coalescence, as it once affected */ki/ in utterance-final position, is formalised as below:

Coalescence:



In this case, the vowel is subject to bare nucleus deletion; some, but not all of the vocalic features (i.e. [+H], [+P] ([+palatal])) reassociate with the adjacent (palatalisable) consonant. The (redundant) vocalic features for voice ([+V]) and sonorant ([+Sn]) do not spread. The resulting segment is assigned the feature [+coronal] ([+Cl]) by default, viz:

D.R. [ ] ---> [+Cl]/[__,+P,-V]

The segment is realised as [ʃ].

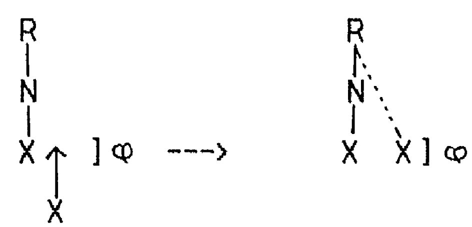
2.1.1.1.2. Consonant epenthesis:

When the final (unsyllabified) vowel is not deleted, it triggers epenthesis of a non-rhyme-headed X slot (with which [h] subsequently associates in Kusmi and Gabiini and [?] or [h] associates in Hubaiʃi, and cf. Behnstedt 1987:7). In Kusmi and Gabiini this occurs when the final vowel is /a/, or, when the adjacent consonant is neither roundable nor palatalisable; in Hubaiʃi, this process occurs in all cases other than the (first singular) perfective inflectional suffix, /ku/, as in the examples below:

/m a d r a s a/	-->	m a d r a s a [h]] φ	'school' (Kus./Gab.)
/m a d r a s a/	-->	m a d r a s a [?/h]] φ	'school' (Hub.)
/? a i w a/	-->	? e e w a [h]] φ	'yes' (Kus./Gab.)
/? a i w a/	-->	? e i w a [?/h]] φ	'yes' (Hub.)
/ʃ i m i h + k i/	-->	ʃ i m i h k i [?/h]] φ	'you f.s. saw' (Hub.)
/ʃ i m i h + k + u/	-->	ʃ i m i h k u [?/h]] φ	'you m. saw him'(H)
/h u/	-->	h u [h]] φ	'he'
/h i/	-->	h i [h]] φ	'she'

Consonant epenthesis (cf. 1.3.2.1.) is diagrammed as an instance of rhyme branching (cf. 1.5.4.), as below:

Rhyme branching:



Rhyme branching is dealt with in further detail in chapter three (cf. 3.1.1.2.).

2.1.1.2. Final long vowels:

As a means of considering the representation of glides, the treatment of long vowels in utterance-final position is particularly relevant. When a nucleus linked to two timing slots on the morphological template occurs in utterance-final position, either diphthongisation or glottalisation occurs:

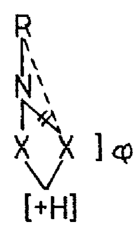
2.1.1.2.1. Diphthongisation:

The right-most X slot is desyllabicised to produce a diphthong, if the vowel is high. The desyllabicised segment is identical to its rhyme-headed counterpart in all but the rhyme-head, viz:

/s i m i ^{C} + n i i/	--->	s i m i ^{C} n [i j]]$_{\varphi}$ 'he heard me'
/s i m i ^{C} + u u/	--->	s i m i ^{C} [u w]]$_{\varphi}$ 'they m. heard' (H/G)

Diphthongisation involves delinking the right-most rhyme-headed slot from the nucleus node. The delinked slot subsequently reassociates directly with the rhyme node. This is diagrammed below:

Diphthongisation:



(cf. 1.3.2.3.)

Diphthongisation of final long vowels is neither peculiar to these dialects, nor to dialects of Yemeni Arabic. Jastrow noted a slight dipthongisation of final vowels in the dialect spoken in Jariim:

/w a l a d i i/	--->	w a l a d [i j]]$_{\varphi}$
/? a k a l u u/	--->	? a k a l [u w]]$_{\varphi}$ (Fischer and Jastrow 1980:111)

And Said notes that 'a trace of [w] may be noticed on the release of [uu]' in final position, and that the same phenomenon affects final /ii/ in his native Baghdadi (Said 1983:148-9).

2.1.1.2.2. Glottalisation:

In all three dialects, in case a morpheme with a final long /aa/ vowel occurs in utterance-final position, the vowel is realised as durationally short, and [?] or [h] is realised to the right of the vowel, as below:

/s i m i ^{C} + n a a/ --->	s i m i ^{C} n [a ?/h]]$_{\varphi}$	'we heard'
/m a a/ --->	m [a ?/h]]$_{\varphi}$	'what'

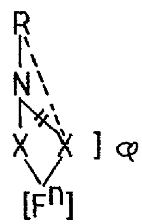
Again, this phenomenon is not peculiar to these dialects, Jastrow mentions pausal glottalisation of forms which end in /aa/ for Jariimi and San^{C}aani (Jastrow 1984:294). Similarly, Rossi identified utterance-final glottalisation of /aa/ in San^{C}aani speech (Rossi 1939:3-4); and Behnstedt notes that long vowels are shortened in pause and often closed by a glottal stop in many North Yemeni dialects (Behnstedt 1985:7, note 10). Note that long /aa/ and short /a/ are neutralised in utterance-final position, viz:

/m a a/ --->	m a [?/h]]$_{\varphi}$	'what'
/? a i w a/ --->	? e i w a [?/h]]$_{\varphi}$	'yes'

2.1.2. Laryngeals and high glides as non-syllabic vocoids:

In both processes mentioned above, the quality of the utterance-final glide (or non-syllabic) is similar to that of the preceding syllabic: in utterance-final position, a long high non-round vowel is pronounced as [ij], a long high round vowel is pronounced as [uw], and a long vowel which is not high is pronounced as [ah] or [a?]. It appears that the relationship between /a/ and [?]/[h] is similar to that between /i/ and [j], /u/ and [w]. There is a generalisation that must be captured. The scope of diphthongisation is extended to account for glottal phenomena. In a configurational representation this process, which I call 'Identity Diphthongisation' (Hayward and Watson, to appear), is diagrammed below:

Identity Diphthongisation:



(where $[F^n]$ = 'all features')

Within this generalisation, it is assumed that glides and laryngeals enjoy the same feature specifications as their syllabic counterparts. For Yemeni Arabic, therefore, it is argued that glides and laryngeals derived in the post-lexical component are represented on the vocalic tier underlyingly, and surface as non-syllabic vocoids - i.e. as vowels in all but their association with rhyme-heads. Glides and laryngeals which form part of the underlying root consonantism, on the other hand, are represented underlyingly on the consonantal tier and consonantal features (eg. [+continuant], [+sonorant], [+palatal]) form part of their componential make-up underlyingly.

2.1.2.1. The 'glide' problem:

The problem of the representation of glides and laryngeals is not new. Hyman echoes the sentiments of many linguists as he suggests that:

> 'Perhaps the most problematic segment for all theories of phonology is the class of glides.' (Hyman 1985:76)

Pike recognises the segmental identity of glides and vowels in <u>Phonetics</u> (Pike 1943). Firstly, he disputes the traditional division between consonant and vowel mentioning the use of criteria of conflicting status by linguists and phoneticians in drawing up this division:

> 'The most basic, characteristic and universal division made in phonetic classification is that of consonant and vowel. Its delineation is one of the least satisfactory . . .

Frequently for descriptions of single languages the division is assumed, with no attempt to define it.'
(Pike 1943:66)

He concludes by assigning certain sounds into groups according to their articulatory and acoustic nature without reference to their phonemic contextual function. Vocalic sounds are assigned to the vocoid group, consonantal sounds to the contoid group. Vowels and consonants are then categories of sounds, not as determined by their own phonetic nature, but according to their groupings in specific syllable contextual functions (Pike 1943:78). Within these groups, vocoids include all sounds considered vowels and glides, contoids include everything else.

Guerssel, in a paper in which he discusses variation between high vowels and glides in Berber, suggests that the distinction between glides and vowels is a function of syllable structure rather than the inherent property of each segment type. While Hubaiʃi, Kusmi and Gabiini do not enjoy the same wealth of intricate phonological variation between glides and high vowels evident in Berber, interesting variations between glides and all underlying vowels are attested - and the phenomenon is not limited to high vowels and high glides. Maximal simplicity and generalisation can be captured through the assignment of identical feature specifications for glides and vowels in these Yemeni dialects. Glides and vowels constitute a single segment type: if associated with a non-rhyme-headed X slot, the segment is realised as non-syllabic; if associated with a rhyme-headed X slot, the segment is realised as syllabic (and cf. Guerssel 1986:6). Whether a glide/vowel associates with a rhyme-headed or with a non-rhyme-headed X slot is frequently a question of the phonological environment. In general, in these dialects as in Classical Arabic, an underlying glide will associate with a nuclear X slot to the left of a consonant (and palatal or roundness spread - in Hubaiʃi - or monophthongisation - in Kusmi and Gabiini - will take place), eg:

root			
/? j w/	--->	? e [i] w a	'yes' (Hub.)
/q w l/	--->	q o [u] l	'talk' (Hub.)
/? j w/	--->	? e [e] w a	'yes' (Kus./Gab.)
/q w l/	--->	q o [o] l	'talk' (Kus./Gab.)

2.1.2.2. The position of laryngeals:

While I appreciate Lass's arguments (1976:146) that the laryngeals [h] and [?] are phonetically non-sonorant and, for this reason, do not warrant classification along with the high glides [j] and [w],[1.] it must be conceded that the relationship enjoyed by /a/ and [h]/[?] in Yemeni Arabic is structurally identical to the relationship between /i/ and [j], and between /u/ and [w]. Some means are needed by which to capture this relationship and so I propose the classification of traditional glides and laryngeals in these Yemeni dialects as 'non-syllabic vocoids'. This proposed analysis has the advantages of:

a) distinguishing surface glides from surface vowels in respect to structure: a glide is a vocoid which is associated with a non-rhyme-headed X slot; a vowel is a vocoid which is associated with a rhyme-headed X slot;

b) capturing the segmental identity of the vocoid type in terms of feature specifications.

2.2. Features in the vocalic matrix:

Consideration of what constitutes the most highly-valued matrix breaks into three categories:

1. Archangeli, however, specifies laryngeals as [+son] on account of their patterning with sonorants in Yawelmani (Archangeli 1984a:98-100).

a) minimality in the rules necessary to supply the missing feature-values;
b) minimality in the number of feature-values (i.e. in this model, the number of pluses) in underlying representation;
c) minimality in the number of features in underlying representation.

The theory ranks the third option above the other two and the second above the first (Archangeli 1984a:48). Firstly, in determining which features we are to use, we must detail what it is we wish to capture. An initial point of departure is that glides and vowels have identical specifications in order to capture the segmental identity of vocoids.

Let us turn to the vocalic inventory:

Vowels:

Underlyingly, there are three short vowels in the Yemeni varieties under discussion. However, in respect to the Hubaiʃi, Kusmi and Gabiini data, specifications are necessary for five surface vowels to account for the manifestation of raised [e] from /a/ when /a/ occurs in the immediate environment of /i/ or /j/, and lowered [o] from /u/ when /u/ occurs in the immediate environment of /a/, a pharyngeal or an emphatic (pharyngealised) consonant. Since the Hubaiʃi [e] and [o] vowels, and the Kusmi and Gabiini [ee] and [oo] vowels are either predictable derivatives of underlying diphthongs, or are realised in consequence of occurring in the immediate environment of a palatal, round or pharyngeal(ised) consonant, they are not represented underlyingly. In none of the three dialects do the diphthongs [au] or [aj] surface. In Kusmi and Gabiini, a late post-lexical process of monophthongisation operates (cf. 7.2.2.1.1. and 8.3.6.2.2.), while in Hubaiʃi, a late post-lexical process of palatal or roundness spread applies (cf. 7.2.1.1.1.1. and 8.4.5.2.2.).

Long vowels:

There are five durationally long vowels in Kusmi and Gabiini and there are three durationally long vowels in Hubaiʃi; however, long vowels are not represented underlyingly. This is in consequence of the Obligatory Contour Principle applying in these dialects which states that the representation:

```
 X   X
 |   |
[F] [F]
```

is less highly-valued than the representation:

```
X   X
 \ /
 [F]
```

(0.4.1.1.2.2. and cf. McCarthy 1981:384, 1985:238, 1986:208).

Levin claims that:

> 'In Arabic, a long vowel is derived by the process of association to a skeleton containing a VV or a VC sequence.' (Levin 1983:11)

Long vowels are represented as two contiguous timing slots on the skeletal tier linked to one syllable nucleus and to a single feature matrix (Levin 1983:8):

```
  N
 / \
X   X
 \ /
 [F]
```

(cf. 1.4.4.1.)

While long nuclei are primitive in these dialects, durationally long vowels are not, but are derived by association.

In terms of the underlying three-vowel inventory, the three language systems are identical:

Underlyingly represented vowels:

Hub. Kus. Gab.		
/i/		/u/
	/a/	

The surface five-vowel inventory differs between the two dialects in that, while in Hubaiʃi, pronunciations of derived mid-vowels are durationally short, in Gabiini and Kusmi, pronunciations of derived mid-vowels are durationally long:

Surface realisations:

Hub.			Kus./Gab.		
[i]		[u]	[i]		[u]
[e]		[o]			
	[a]			[a]	
[ii]		[uu]	[ii]		[uu]
			[ee]		[oo]
	[aa]			[aa]	

Operating with the vocalic features carried forward from SPE by Archangeli (1984a:74ff.), the fully specified matrix for surface vowels in these dialects appears as below:

	[i]	[e]	[a]	[o]	[u]
H	+	–	–	–	+
L	–	–	+	–	–
R	–	–	–	+	+
B	–	–	+	+	+

Application of these specifications to the inventory of surface non-syllabic vocoids would provide the following fully specified matrix:

	[j]	[h]	[?]	[w]
H	+	–	–	+
L	–	–	–	–
R	–	–	–	+
B	–	–	–	+

(and cf. Archangeli 1984a:98)

However, there is a problem with these features: and this concerns the feature specifications of [h], [?] and [a]. As argued above, it is necessary to specify in such a way as to capture the segmental sameness of vowels and non-syllabic vocoids (cf. 2.1.2.). While this is achieved for the high vocoids with the features [R] and [H] - since [+R,+H] specifies both [u] and [w], and [+H] specifies [i] and [j] - the features posited above specify [a], but not [h] and [?] (where '-' is interpretable as 'nothing at all') since both lip rounding and the height of the body of tongue are quite immaterial in the articulation of these laryngeal segments. With [a] specified and [h] and [?] not, this necessarily means that the segmental identity of [a], [h] and [?] is not captured.

In respect to [L], [+L] is sometimes assigned to both [h] and [?]. Lass cites SPE specification for [?] as:

$$\begin{bmatrix} \text{+sonorant} \\ \text{- consonantal} \\ \text{- vocalic} \\ \text{- anterior} \\ \text{- coronal} \\ \text{- high} \\ \text{+ low} \\ \text{- back} \end{bmatrix}$$

(Chomsky and Halle 1968:307, in Lass 1976:152)

As Lass maintains:

> 'the specification [+low] - if it's not a typographical error - is rather odd: surely a segment articulated outside the oral cavity cannot involve a tongue-body feature.' (Lass 1976:152)

In Lass's schema, 'any segment made in the oral cavity or pharynx is [+oral], any articulation below the epiglottis is [-oral]' (Lass 1984:84). [h] and [?] are laryngeal articulations, produced outside the oral cavity and independently thereof. Certainly, the specification [+L] is in order for neither [h] nor [?]. The feature [L] refers to the position of the body of the tongue and the tongue may, quite legitimately, occupy any degree of height in the articulation of these sounds. Similar arguments against the feature [B] are legitimate, since [B] is also a body of tongue feature. In SPE, as seen above, [?] is assigned the feature-value [-B]; in other works, both [h] and [?] are assigned the feature-value [+B]. (In Archangeli [?] and [h] are assigned the feature-values [-L] and [-B] (Archangeli 1984a:98)). There is no distinctive relevance in the feature [B] for these segments since these prime laryngeal segments are produced outside the oral cavity and are not dependent on any particular body of tongue feature. Leaving aside lip-rounding and the feature, [H], both of which are non-distinctive for laryngeals, the body of tongue may be in the following positions for the articulation of these segments - and in no case are either [B] or [L] distinctive:

[+B,-L], [-B,-L], [+B,+L], [-B,+L]

2.2.1. The feature [guttural]:

To resolve the laryngeal problem, Lass proposes that any segment is a hierarchised set of submatrices with an oral gesture and a laryngeal gesture. All oral segments have both oral and laryngeal gestures while pure laryngeals have a laryngeal gesture but redundantly lack an oral gesture (Lass 1976:154 and 1984:115). While Lass's insights are useful, he has failed to indicate any zone of constriction for pure laryngeal segments, and this is necessary in terms of the present model. I wish to posit features which capture Lass's observations, which will distinguish laryngeals from other segments, which will provide insight into the relationship between [h], [?] and [a] - such that [a] is seen to be a rhyme-headed segment which has as non-rhyme headed counterparts [h] and [?] - and which will relate laryngeals with other segments with which they can be said to form a natural class - i.e. the pharyngeals, the uvular stop, /q/, and the uvular fricative, /gh/. The solution I propose, at this stage, is to replace the discrete body of tongue features, [L] and [B], with features which indicate the zone of the vocal tract in which constriction occurs. Firstly, I replace [L] with [guttural], ([G]).

2.2.1.1. [+Guttural] segments:

The definition of [guttural] provided by Hayward and Hayward (to appear) is adopted in this thesis, and reads as follows:

> 'the 'guttural' class should provisionally be defined as including those sounds having a constriction in the pharyngeo-laryngeal region, i.e. in that part of the vocal tract which extends from the end of the oral cavity (i.e. the uvula) to the larynx.' (Hayward and Hayward, to appear).

The use of [guttural] ([G]) is not new. Murtonen uses the feature for consonants in Early Semitic:

> 'By this term we understand all the consonants, the main

articulation basis of which lies beyond the velar region.' (Murtonen 1967:7)

In our model, the feature [G] functions in the composition of the following segments in the sound systems of Hubaiʃi, Kusmi and Gabiini:

> true pharyngeals, /H/ and /^{C}/; the uvular stop, /q/; the uvular fricative, /gh/, in Hubaiʃi; the laryngeals, /h/ and /?/; and the vowel, /a/.

In the inclusion of [G], I am operating with a distinctive feature system which considers zonal in addition to discrete positional features. In positing [G], it is necessary to consider whether this feature will be distinctive on the vocalic tier, and also, whether it will provide insight into the interaction between the two systems within the prosodic structure. In this light, consider the Feature Minimization Principle (0.4.1.4.1.1.), repeated below for convenience:

Feature Minimization Principle:

> A grammar is most highly valued when the underlying representation includes the minimal number of features necessary to make different the phonemes of the language. (Archangeli 1984a:50)

This principle forces the use of the same features for consonants as are required for vowels (Archangeli 1984a:54). It is necessary to consider, therefore, not only the way in which features operate on the vocalic tier, but also, how effective use can be made of the same features on the consonantal tier. It must be seen whether [+G] segments, as defined above, do form a natural class. To this end, I shall examine the effect of guttural consonants on syllable structure and the effect of guttural consonants on vowel quality.

2.2.1.2. The effect of [+G] consonants on syllable structure:

Consider the 'gahawah' syndrome, peculiar to Bedouin dialects, and here explicated by Jastrow:

> 'In allen Beduinendialekten der arabischen Halbinsel, eingeschlossen die Dialekte des Golfs, findet sich das sogenannte gahawah Syndrom - aXK --> aXaK - wenn X = x, gh, H, ^{C}, . . . das erste <u>a</u> fällt meistens aus, so daß der Eindruck eines Vokalumsprungs entsteht:
> gahwah --> gahawah --> ghawah   Kaffee
> aHmar --> aHamar --> Hamar   rot'
> (Fischer and Jastrow 1980:109)

In the 'gahawah' syndrome, the presence of guttural consonants influences syllable structure. Use of the feature [G] enables us to group together all consonants which influence syllable structure in this way. Johnstone also notes the influence of gutturals on syllable structure in the vicinity of /a/:

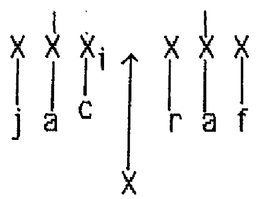
> 'In the EA dialects and in all the North Arabian dialects, a non-final closed syllable whose vowel is /a/ in which the closing C is a guttural, becomes an open syllable of the structure CGa.' (Johnstone 1967:6) [1, 2]

1. Note that Johnstone uses the term 'syllable' in rather a loose way, and not as in this thesis.
2. Guttural consonants in Ethiopic often produce alternations of a given word pattern, including lengthening of the vowel in the pattern -aG- --> -aaG- as in <u>yesmaa^{C}</u> versus <u>yeqdar'</u>(Lambdin 1978:7-8).

While Hubaiʃi, Gabiini and Kusmi do not have the 'gahawah syndrome', in common with many other dialects of Yemeni Arabic, they do have a related phenomenon; in the pattern:

$$X \; X \; X_i \; X \; X \; X \quad \text{(imperfect verb)}$$

where a guttural is the first root consonant and is associated with X_i, as in /j a ^{c} r a f/ 'he knows', a phonological rule of epenthesis is triggered by the association of the guttural with X_i, viz:



The epenthesised rhyme-headed X slot is filled by [a] and the output of epenthesis is as below:

j a ^{c} [a] r a f   'he knows'

Similarly, association of the consonantal root H-m-l with the imperfect template does not yield: *j a H m a l

rather, it yields: j a H [a] m a l   'he carries' [1].

And association of the root h-b-l with the imperfect template yields:

t a h [a] b i l   'she is pregnant'

2.2.1.3. The effect of [+G] consonants on vowel quality:

Probably due to the palatalising effect of the (third masculine singular) subject pronoun, /j/, the vowel of the imperfect prefix is generally realised as [i] in all three dialects, (cf. 2.4.2.1.1.2.) as in:

j [i] g l i s   'he sits'

1. Greenberg notes that laryngeals and pharyngeals behave in the same fashion in terms of their patterning in Classical Arabic root morphemes and for that reason should be considered a single class of consonants (Greenberg 1950:168).

j [i] s r a H	'he goes'
j [i] s i i r	'he goes'
j [i] ʃ m a h	'he sees'

By analogy, the imperfect prefix vowel is generally realised as [i] in other inflections and may be realised as [i] in the imperative forms. However, when the consonant associated to X_i contains among its specifications the feature [G], the vowel of the imperfect prefix is not realised as [i], rather as [a]:

j [a] ^{c} a r a f	'he knows'
j [a] H a m a l	'he carries'
j [a] ^{c} a m a l	'he works/does'
t [a] h a b i l	'she is pregnant'

When the first radical is /?/, as in the Kusmi and Gabiini verb ?ata 'he came', although /?/ is deleted in the imperfect aspect (by means of laryngeal disassociation, cf. 1.6.2.3. and 1.7.3.2.), the imperfect prefix vowel is still realised as a long [aa], viz:

? a t a	'he came'
j a a t i i	'he comes'
t a a t i i	'she comes'
n a a t i i	'we come' (and cf. Diem 1973:87)

Broselow notes a similar phenomenon in ECA. The imperfect stem vowel of verbs which have as one of their root radicals: /S, D, T, Z, gh, x, H, h, ?, ^{c}, r/ is invariably [a]. In all other cases, it is [i]. In explaining this phenomenon, she suggests these segments all share the feature [B]:

> 'I suspect this fact reflects a historical rather than a synchronic generalisation. All these sounds, except /r/,

involve articulation in the back of the vocalic tract.' (Broselow 1976:140).

However, not only do some of these consonants not have the feature [+B] among their specifications, as I have argued above - viz, /h/ and /?/ - but also, /k/, which is a back consonant, does not affect the quality of the stem vowel. The feature shared by these consonants, and [a], is [+G], and not [+B]. Recourse to a feature, [G], shared by the vocalic and consonantal systems enables both a classification of a group of consonants which affect syllable structure, and an explanation of the relationship between guttural consonants and vowels.

2.2.2. The feature [palatal]:

The second feature I wish to substitute is [palatal] ([P]) for [B]. Fromkin considered the use of this feature in order to account for various palatal assimilation processes in Fante, a dialect of Akan (Fromkin 1968:161-2). More recently, this feature was reproposed by Hayward in order to account for the vowel system in Amharic (Hayward 1986:320, Hayward and Hayward, to appear). The definition of [palatal] used in this thesis is adopted from Fromkin such that it is used to define a class of segments which includes non-low front vowels and palatal and palatalised consonants (Fromkin 1968:162). As in the case of [G], it is necessary to decide whether segments sharing the feature [+P] in their specification do form a natural class.

2.2.2.1. Nasal infection:

A process of nasal infection operates in the post-lexical component where [+nasal] appears on an utterance-final [ij] sequence in Hubaiʃi and Kusmi, and on final [ij] and [uw] sequences in Gabiini. (This process will be dealt with in more detail in the Appendix, cf. A.1.). As this constitutes a late post-lexical rule, the feature [+nasal] ([+N]) is not represented in the vocalic matrix; a means is, however, needed by which to capture generalities concerning the segments affected. In Gabiini, the scope of nasal infection can be captured with the feature [+H] in the statement:

2.2.2.1.1. 'In utterance-final position, [+N] appears on [+H] vocoid sequences.'

This statement is adequate for both Gabiini and Kusmi, since no final [uw] sequence surfaces in the latter dialect. In Hubaiʃi, however, since [uw] does appear utterance-finally, this formulation would be inadequate: both [+H] and [-B] would need to be stipulated in order that [nasal] infect [ij] and only [ij] sequences. Adopting the feature [P], simplifies explanation of the process. The following statement is forwarded for nasalisation in Hubaiʃi:

2.2.2.1.2. 'In utterance-final position, [+N] appears on [+P] vocoid sequences.'

2.2.2.2. Palatalisation processes:

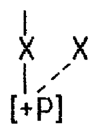
The feature [P] accounts, not only for the palatal vowel /i/, but also for palatalised phonetic variants of /a/ - eg. [e] ([+G,+P], cf. 2.3.1.). On the vocalic tier, it captures the segmental sameness of palatal syllabic and non-syllabic vocoids, while on the consonantal tier the feature aids an account of processes of palatalisation, common in both dialects, involving tongue-fronting, tongue-raising and spirantisation (Bhat 1974). While [B] could account for palatalisation in terms of tongue-fronting (i.e. velar fronting), it fails to provide a convincing account of palatalisation in terms of raising from the coronal to the palatal zone of constriction as in /s/ ---> [ʃ], in:

a) /k i i s/ ---> k i i [ʃ] 'bag'

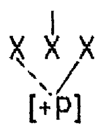
b) /s a j j a a r a/ ---> [ʃ] a j j a a r a 'car'

Palatalisation, in the above instances, is represented as a spread process which operates from left-to-right or from right-to-left onto contiguous segments once tiers have been conflated, as in a), or from one segment to a segment contiguous with it on the same tier prior to tier conflation:

a)



b)



Recourse to the feature [P] enables us to stipulate that the zone of constriction node of a non-palatal receives a new feature association in the environment of a palatal. Not only does [P] provide this useful mechanism, it does so without the same unfortunate implications as [B]: while [h] and [ʔ] may be either [+B] or [-B], they, along with [a], are as decidedly non-palatal as they are decidedly guttural.

2.3. Vocalic matrices:

I shall now examine the way in which these features affect the vocalic matrices for the dialects. The fully specified matrix for surface vowels appears as below:

2.3.1. Surface vowels:

	i	e	a	o	u
H	+	–	–	–	+
G	–	+	+	+	–
R	–	–	–	+	+
P	+	+	–	–	–

The fully specified matrices for underlying vowels and surface non-syllabic vocoids in the dialects appear as below:

2.3.1.1. Vowels:

	i	a	u
H	+	–	+
G	–	+	–
R	–	–	+
P	+	–	–

2.3.1.2. Non-syllabic vocoids:

	j	h	?	w
H	+	–	–	+
G	–	+	+	–
R	–	–	–	+
P	+	–	–	–

As 2.3.1.1. and 2.3.1.2. are slotted together, the following relationship is observed:

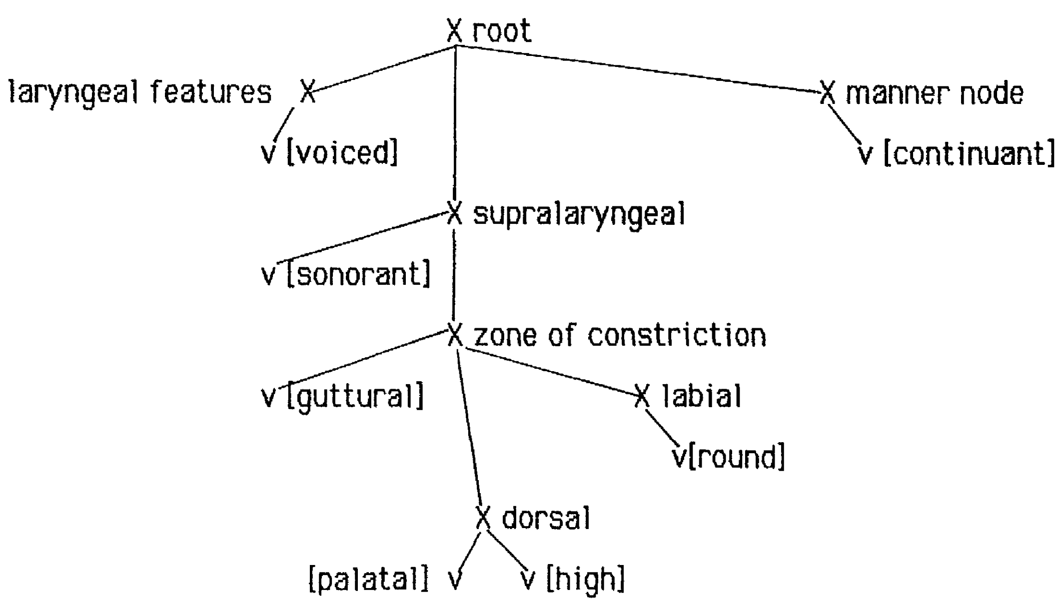
2.3.1.3.

	i	a	u
H	+	–	+
G	–	+	–
R	–	–	+
P	+	–	–
	j	h ?	w

This solution succeeds in capturing the relationship between the round vocoids /u/ and [w], between the palatal vocoids /i/ and [j] and between the guttural vocoids /a/ and [h]/[?]. All vowel phonemes and their non-syllabic counterparts are distinct.

2.3.2. The feature matrix tree:

The distinctive features may be represented as terminal nodes on the feature matrix tree. Since all vowels are [+continuant], [+voiced] and [+sonorant], these features are redundantly present on the feature matrix tree. The feature matrix tree for vowels appears as below:



2.3.3. The consequences of eliminating the features [B] and [L]:

Although it does appear that the features [G] and [P] capture with more simplicity and greater economy generalisations of the phonology than [B] and [L], the consequences of eliminating [B] and [L] must be considered. Within underspecification theory, the concept of <u>distinctive</u> features is highly significant (Archangeli 1984a:43). Only features which do not distinguish between sounds have no values supplied in underlying representation (Archangeli 1984a:41). It is necessary to determine, therefore, prior to the elimination of certain features, that the features eliminated are not distinctive for the dialects of Hubaiʃi, Kusmi and Gabiini.

2.3.3.1. [Back]:

Consider the fully specified four-feature matrix relating to the underlying three-vowel system. The feature [B] is returned:

	i	a	u
H	+	–	+
G	–	+	–
R	–	–	+
B	–	+	+

/a/ and /u/ have the specification [+B]. Were [B] removed, however, relevant phonemes are still distinct since it is roundness ([+R]) which distinguishes between the high vowels, and gutturality ([+G]) which distinguishes /a/ from the high vowels. Since, as will be seen, [R] is the feature which distinguishes /u/ from /i/, [B] is non-distinctive for /u/; the following default rule fills in the feature-value for [B] on the round vowel as below:

D.R. [ ] ---> [+B]/[___,+R]

For a three vowel system, /u,i,a/, in which roundness were not distinctive, [B] may well prove distinctive. For our purposes, however, just as for Ethiopian Semitic languages (Hayward, in print), it is precisely this roundness specification, rather than backness, which is distinctive. [B] as a vocalic feature is redundant.

2.3.3.1.1. [Back] as a consonantal feature:

The Feature Minimization Principle requires that maximal mileage is gained from features such that, as far as possible, any feature is applicable in both the consonantal and vocalic systems (cf. 0.4.1.4.1.1.); it is necessary, therefore, to consider how removal of [B] from the matrix specifications would affect the consonantal matrix: if [B] is not a vocalic feature, but is a consonantal feature, this weakens the argument. Observation of consonantal behaviour, however, lends extra weight to the redundancy of [B] in these language systems: as argued above, the position of the body of tongue is not distinctive in the production of laryngeals; also, any consonant produced with a high body of tongue configuration (which could be distinguished by the feature [B]) - i.e. /k/ - is distinguished from other [+H] consonants in these language systems by redundantly lacking the feature [P] (cf. 3.3.2.). [B] is therefore seen to be redundant in the consonantal system as well as in the vocalic system.

2.3.3.2. [Low]:

And so, replacing [P] for [B], consider the matrix below in which [L] is returned:

	i	a	u
H	+	-	+
L	-	+	-
R	-	-	+
P	+	-	-

In contrast to [B], [L] does distinguish /a/ in the vocalic system; however, [L] is not distinctive in the consonantal system. Firstly, it fails to capture the relationship between /a/ and the laryngeals since [L] (together with [B]) is not distinctive for laryngeals (cf. 2.2.). And secondly, while [L] (together with [B]) is frequently assigned as a correlate of emphasis (pharyngealisation, cf. Chomsky and Halle 1968), as pointed out by Brame, [+B,+L] cannot indicate the emphatic articulation of segments since a high front vowel may be produced with emphasis, as in:

t i i n 'figs' versus T<u>i</u> <u>i</u> n 'mud' (cf. Brame 1970, cited in Broselow 1976)

The distinctive feature for emphasis is established in the present case as [pharyngeal] (cf. 3.3.3.). The distinctive feature for pharyngeal consonants (which are arguably [+L]) is also posited as [pharyngeal]. It is concluded that [L] is not distinctive in the consonantal system in these dialects, and, therefore, in view of the Feature Minimization Principle and the need to capture the relationship between the guttural syllabic and non-syllabic vocoids [L] is not posited as a feature of the vocalic system.

2.3.4. The vocalic system:

Having identified distinctive features within the vocalic feature system, I now wish to concentrate on the underlying systems to which structure preservation applies. Below, the fully specified matrix for [high], [guttural], [round] and [palatal] appears as:

	a	i	u
H	–	+	+
G	+	–	–
R	–	–	+
P	–	+	–

It has always been part of a general research strategy in generative phonology that predictable aspects of a phonological string are filled in by rule. As noted above in the introduction, underspecification adopts the hypothesis that all redundant (i.e. predictable) information is excluded from the lexical entry (cf. 0.4.1.4., Kiparsky 1982b, Archangeli 1984a:11, Pulleyblank 1986:103, 1988:236). The above matrix contains a number of redundancies. Any phoneme not marked [+F], where [F] is a feature in the matrix, is redundantly marked [-F] for that feature; all negative values are removed, therefore, allowing complement rules to supply missing values, viz:

	a	i	u
H		+	+
G	+		
R			+
p		+	

It is necessary to reduce, not only the number of feature-values depicted, but rather both the underlying number of depicted feature-values and the number of features, in order to express generalities about the phonology in the most succinct and economical manner.

I shall operate with the least number of features necessary to distinguish phonemes in the light of the Feature Minimization Principle (cf. 0.4.1.4.1.1.). The least number of features needed to distinguish between three phonemes is two. As the number of features depicted is reduced to two, a number of possible permutations are observed. The chosen features may not be selected at random. Whether a feature is distinctive or not depends on the particular language system, and not solely on language universals. There is more than one representation of the vowels within a three vowel system, and the phonology of the language determines which representation is the correct one:

2.3.4.1. The features [G] and [P]:

for example, consider a matrix in which the features [G] and [P] were distinctive:

	a	i	u
G	+	–	–
P	–	+	–

With these features, a maximum of one phoneme would be positively marked for a maximum of one feature. Once all redundant information were removed, there would be no more than one phoneme marked once and each feature would have one specification, viz:

	a	i	u
G	+		
P		+	

2.4. The non-specified vowel:

By allowing one phoneme to be totally unspecified in underlying representation, the prediction made is that this phoneme may behave asymmetrically in regard to other phonemes of the same prosodic cateory within the language system (Archangeli 1984a:42). The asymmetrical behaviour of this segment is brought about precisely by virtue of other phonemes in the system possessing at least one specification underlyingly while this phoneme does not (Pulleyblank 1988:240). The matrix with the features [G] and [P] (2.3.4.1.) provides one such asymmetrical vowel (NSV). For a system in which [+R] were not distinctive and [u] constituted the default realisation of the NSV, this matrix would be the relevant one.[1]

1. Archangeli provides an underspecified matrix for Telegu which has a five vowel system and a minimal vowel phoneme /u/ (Archangeli 1984a:59).

2.4.1. The distinctiveness of [R]:

In the dialects of Yemeni Arabic examined here, however, /u/ will be seen to constitute a marked vowel phoneme; also, it is precisely the feature [R] which distinguishes /u/ in the vocalic system, and /w/ in the consonantal system.

2.4.1.1. Hubaiʃi:

In Hubaiʃi, [+R] on the vocalic tier serves to distinguish the {first singular} inflectional form in the perfect aspect of the verb from the {second masculine singular} inflectional form, as in:

k a t [u] b k	'I wrote'	k a t [a] b k	'you m.s. wrote'
ʃ [u] m [u] h k	'I saw'	ʃ [i] m [i] h k	'you m.s. saw
? a b S [u] r k	'I saw'	? a b S [a] r k	'you m.s. saw'

In case a vowel-initial object pronoun is added to the {first singular} inflection, [+R] is manifested on the consonantal tier as a result of complex consonant formation, as in:

? a b S a r [k^W] i i 'I saw her'   ? a b S a r [k^W] i i k   'I saw you f.s.'

In short, for any morpheme ending in /ku/, /mu/ or /bu/ in Hubaiʃi - i.e. a roundable consonant followed by /u/ - [+R] is realised on the consonantal tier when this morpheme is followed by a morpheme with initial /i/ (cf. 1.7.2.2.1.), as illustrated below:

j i s a m [m^W] i i	'they m. call her'
j i s a m [m^W] i i k	'they m. call you f.s.'

as opposed to:

j i s a m m [u u]	'they m. call (s.o./s.th.)'

? a [b^{W}] i i k 'your f.s. father'

? a [b^{W}] i i 'her father'

as opposed to:

? a [b u] f u l a a n 'someone's father'

[m^{W}] i s m i k 'what's your f.s. name?'

as opposed to:

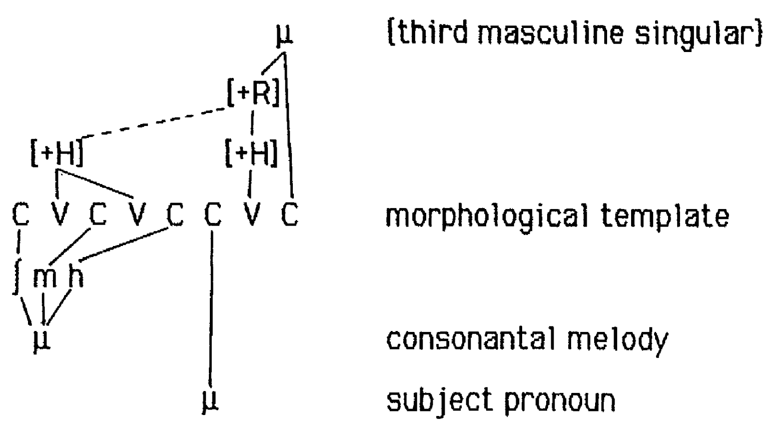
m [u] k t u b 'what should I write?'

2.4.1.2. [+R] spread in Kusmi:

In Kusmi and Hubaiʃi, a process of [+R] spread affects the vowels of some morphemes operating from right-to-left from a [+R] vocalic trigger in one morpheme to [+H] target vowels in an adjacent morpheme (and cf. chapter eight):

i. /ʃ i m i h + a t + u h/	--> ʃ [u] m [u] h t u h	'she saw him'	(Kus.)
ii. /ʃ i m i h + k + u h/	--> ʃ [u] m [u] h k u h	'you m.s. saw him'	(Kus.)
iii. /ʃ i m i h + k u/	--> ʃ [u] m [u] h [k^{W}]	'I saw'	(Kus.)
iv. /ʃ i m i h + k u/	--> ʃ [u] m [u] h k	'I saw'	(Hub.)

[+R] spread is diagrammed as it affects the Kusmi examples i. and ii. above as below:



2.4.2. Establishment of the NSV in the dialects:

The choice of the vocalic matrix and the interdependent choice of the non-specified vowel are not dependent on abstract universals but rather on the particular language system. Variation between dialects with identical inventories can be partially explained by the matrix specification of one dialect differing from the matrix specification of another, since the NSV is that vowel which acts asymmetrically within the vocalic system of the particular language. Asymmetric characteristics of a lexical NSV include lexical frequency of occurrence and morphological function; in what follows, I am concerned with establishing the default realisation of the post-lexical NSV, the characteristics of which include epenthetic function, a propensity to deletion, and a propensity to be the target and not the trigger of assimilation processes (cf. 0.4.1.4.3.). I shall begin with Hubaiʃi.

2.4.2.1. Hubaiʃi:

2.4.2.1.1. Epenthesis:

The least marked vowel in any language system is generally held to be that which would surface from, or 'replace', 'zero' in order that phonotactic constraints are not violated (Lass 1984:184). The general term for this 'replacement of zero' is epenthesis; under epenthesis are recognised, for Hubaiʃi as for Kusmi and Gabiini, two types of insertion: prothesis, whereby a vowel is inserted before initial consonant clusters, and anaptyxis, whereby a vowel is inserted to break up a sequence of two consonants: frequently, anaptyptic vowels are referred to as 'parasite vowels' (Lass1984:184).

2.4.2.1.1.1. Anaptyxis:

In order to determine the identity of the non-specified vowel, let us begin by considering the anaptyptic vowel from attested instances. Considering examples below, the problem does not offer itself for immediate solution (anaptyptic vowels are given in phonetic brackets). Where anaptyxis occurs to break up an illicit cluster in utterance-final position, a contextual form of the morpheme is provided on the right:

i. ʃ a h [a] r]φ	'month'	ʃ a h r (a) w a a H i d	'one month'
ii. k u H [u] l]φ	'antimone'	k u H l i s w i d	'black antimone'
iii. ʃ i ^{C} [a] r]φ	'poetry'	ʃ i ^{C} r (a) ʃ ʃ u ^{C} a r a ?	'poetry of the poets'

iv. H a q q [u] h u m — 'theirs m. (possessive)' [1]

v. b e i t [a] n a a — 'our house'

vi. r a k k a b k [a] h a n — 'you m. s. gave them f. a lift'

vii. b i ^{C} k [a] x u Dh a a r — 'you m.s. sold vegetables'

viii. r a k a b k [a] s a j j a a r a — 'you rode in a car'

As noted in chapter one, syllabification does not allow a guttural consonant followed by a liquid in utterance-final position in any of these dialects (cf. 1.3.1.1.2.). In i., ii. and iii. above, vowel epenthesis is triggered in this position. In iv, v. and vi. above, an illicit sequence of three contiguous consonants results in an unsyllabified consonant which triggers epenthesis of a rhyme-headed X slot with which [a] or [u] subsequently associates. The epenthetic vowel does not have the same realisation, but is seen to adopt the roundness of an adjacent vowel. In vii. and viii. it is seen that [a] associates with the epenthesised rhyme-headed X slot (independent of the quality of the surrounding vowels) when the final unsyllabified consonant of a phonological word triggers vowel

1. When a high vowel occurs in the environment of a pharyngealised or pharyngeal consonant, the vowel is generally lowered and realised as [o], if round, and as [e], if not round (and cf. Broselow 1976:41 for Educated Cairene Arabic -ECA).

epenthesis (and cf. 1.7.3.1.).

2.4.2.1.1.2. Prothesis:

Before determining the default realisation of the NSV, consider the other case involving epenthesis. Consider prothesis in the following instances of [masculine singular] imperatives. Note that prothesis in the case of imperative forms and epenthesis in the case of the imperfect prefix operates in the same way in Kusmi and Gabiini:

[$_\varphi$[? i] g r a!	'run m.s.!'
[$_\varphi$[? i] t k a r b i s!	(literally) 'squat m.s.!'
[$_\varphi$[? i] g l i s!/g l i s!/g [i] l i s!	'sit/sit down m.s.!'
[$_\varphi$[? a] l ^{C} a b!	'play m.s.!'
[$_\varphi$[? a] T l a ^{C}!/T l a^{C}!	'go up m.s.!'
[$_\varphi$[? u] s k u t!/s k u t!	'shut up m.s.!'
[$_\varphi$[? u] S b u r!/S b u r!	'wait m.s.!'

From the fact that imperative forms do occur without the initial vowel and prefer to do so as long as the initial consonant is a sibilant or the second consonant a liquid, /l/ (cf. 1.2.), it can be inferred that the underlying form of the imperative is the stem of the verb, and that any initial vowel results from vowel prothesis triggered in order to preserve structure. The data suggest that the vowel associated with the prothesised slot is realised as [i] unless it occurs in the immediate environment of a consonant which has among its specifications [+G], in which case the vowel is realised as [a], or, in the environment of a [+R] vowel, when it is realised as [u]. [i] seems to occur only in a non-harmonising environment.

Meanwhile, consider attested instances of the imperfect prefix vowel (which is analysed here as epenthetically inserted):

j [i] q u u l	sometimes	j [u] q u u l	'he says'
j [i] b s u l	sometimes	j [u] b s u l	'it is ready'
j [i] ʃ m a h	but never	* j [u] ʃ m a h	'he sees'
j [i] g z a ^{C}	but never	* j [u] g z a ^{C}	'he goes'
j [i] l ^{C} a b	but never	* j [u] l ^{C} a b	'he plays'

From these instances, evidence does weigh heavily in favour of proposing an epenthetic vowel which surfaces in the default case as [i]. Since [u] appears in [+R] harmonising environments only, and [a] appears only in the environment of an emphatic or guttural, it is reasonable to propose that the epenthetic vowel is realised as [i] unless specifications for [a] or [u] are contextually assigned. The optional renderings of j[u]quul 'he says' and j[u]bsul 'it is ready' are accounted for by virtue of the fact that the /i/ vowel is the target of [+R] spread in certain environments; the alternative renderings with a non-rounded vowel (i.e. [i]) may be due to the palatalising influence of the initial palatal /j/ taking precedence over [+R] spread since, where the prefix consonant is /t/, the vowel [u] only is attested when the stem vowel is /u/, viz.

t [u] q u u l 'you m.s. say' and t [u] b s u l 'it m. is ready'

However, by saying that the default realisation of the epenthetic vowel is [i], we are unable to explain realisation of the anaptyptic vowel seen above (2.4.2.1.1.1.); in this case, the vowel is realised as [a] unless it occurs in the environment of a [+R] vowel, in which case it is realised as [u]. A solution may be found in the suggestion that features from the imperfect prefix consonant, /j/, for [third masculine singular] spread onto the vowel. Rossi noted that /j/ frequently affects the height of adjacent vowels in San^{C}aani speech: when a triliteral consonantal melody with medial /j/ associates with the plural pattern: CuCuuC, the initial vowel is realised as

[i], rather than as [u], viz:

/b u j u u t/ ---> b [i] j u u t 'houses' (Rossi 1939:7)

Similarly, /j/ of the imperfect (third masculine singular) subject pronoun is said to affect the quality of the imperfect stem vowel in San^{c}aani, as in:

/j a g u u l/ ---> j [i] g u u l 'he says' (and cf. Rossi 1939:7)

I believe that the same palatalising phenomenon is operating in Hubaiʃi, Kusmi and Gabiini. That the prefix vowel is also realised as [i] in the (second) and (first plural) inflectional forms when the vowel of the verbal stem is not /u/ need not deter us in this analysis since the consonants of these subject pronouns - namely /t/ and /n/ - could be said to share with /i/ the feature [+coronal] (cf. Clements 1976:100). It could also be argued that the prefix vowel of these inflections is realised as [i] on analogy with the (third masculine singular) inflectional form. Note, also, that the imperfect prefix vowel in the (first singular) inflectional form is realised invariably as [a], viz:

? [a] g l i s 'I sit' [1].

Before reaching a decision as to the default value of the NSV, it is necessary to consider one further manifestation of asymmetric behaviour in the vocalic system.

2.4.2.1.2. Deletion:

Not only is the NSV that which associates with epenthesised rhyme-headed X slots, but also, it is that vowel which is most frequently subject to deletion. Consider Hooper:

1. This could, however, be on account of the initial guttural consonant, /?/ (cf. 2.2.1.3.).

'Stress languages which usually have V reduction processes, ... delete the minimal V.' (Hooper 1976:236)

Similarly, Pulleyblank posits [i] as differing from all other vowels in Yoruba on account of, among other characteristics:

> 'it (being) the only vowel that systematically deletes when it is the second vowel in a VV sequence.' (Pulleyblank 1988:233)

In V_iV_{ii} sequences in Yoruba, it is typically V_i that deletes where [i] is not involved. Deletion processes are rife in Hubaiʃi - and far more so than in the Raimi dialects. Goitein, describing the dialect of al-Gades, a dialect which bears many similarities to Hubaiʃi, states:

> 'Owing to the disappearance of glottal spirant and stop, as well as the elimination of other sounds, vowels that come into contact either give way to each other or blend.' (Goitein 1960:18/368)

He suggests that the weak vowel phoneme in al-Gades is /a/:

> 'The u/i element seems to be stronger than a, and u stronger than i.' (Goitein 1960:18/368)

In Hubaiʃi, when a vowel-final and a vowel-initial morpheme are concatenated, it appears that R_i typically disassociates in cases not involving /a/ (cf. 1.7.2.1.). Consider:

/? a b S a r k i + u/	--->	? a b S a r k [u]	'you f.s. saw him'
/b i + u/	--->	b [u]	'there is'

When /a/ is involved, however, it is this vowel which appears to systematically delete in either R_i or R_{ii} position.

a) R_i:

/q a a b a l + n a a + i k/ --> q a a b a l n [i] k		'we met you f.s.'
/q a a b a l + n a a + u/	--> q a a b a l n [u]	'we met him'
/? a b S a r n a a + i/	--> ? a b S a r n [i]	'we saw her'
/? a b S a r n a a + u/	--> ? a b S a r n [u]	'we saw him'
/m a ^{c} a + u/	--> m a ^{c} [u]	'with him'
/m a ^{c} a + i/	--> m a ^{c} [i]	'with her'

b) R_{ii}:

After laryngeal disassociation (cf. cf. 1.6.1.1. and 3.1.2.2.1.), /a/ is deleted in the following examples:

i. /m u u + ? a k t u b/ --> m [u] k t u b — 'what shall I write'

ii. /? a n i i + ? a b S a r k + u/ --> ? a n [i] b S a r k u — 'I f. saw him'

iii. /m a a + ? a d r i i/ --> m [i] d r i i [1]. — 'I don't know'

And /a/ is deleted when associated with R_{ii} as below:

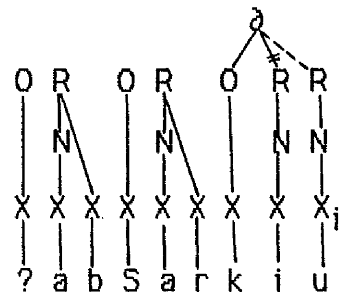
iv. /m a a + ? a b S a r k u + a k + ʃ/ --> m a b S a r k [u] k ʃ — 'I didn't see you m.s.'

It could be said that in a concatenated vowel-vowel sequence R_i disassociates unless R_{ii} is occupied by /a/ in which case the unsyllabified vowel associated with R_{ii} deletes. However, this statement would be rather ad hoc. I suggest that the unsyllabified vowel (R_{ii}) triggers R_i disassociation in all cases in Hubaiʃi; as Pulleyblank states for Yoruba, 'the disruption in the pattern of V_i deletion that results when V_{ii} is [i] is the automatic consequence of the underspecified nature of that vowel' (Pulleyblank 1988:243). We say that [a] constitutes the default realisation

1. Rossi notes midri for maa ?adri 'I don't know' in San^{c}aani (Rossi 1939:8).

of the NSV in this dialect. It differs from other vowels in having no specifications at the point where relevant rules apply. Instances of R_i disassociation in Hubaiʃi are given below ('ə' is denoted by an unassociated 'X'):

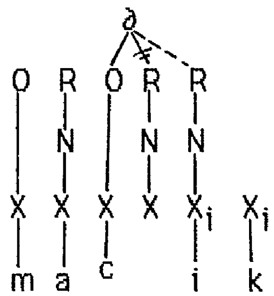
i.



---> ? a b S a r k [u]

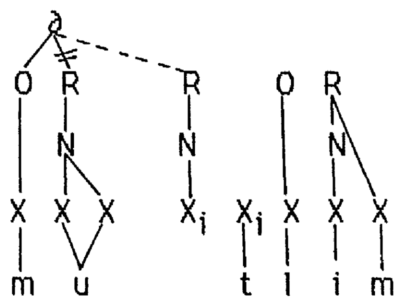
'you f.s. saw him'

ii.



---> m a ^{c} [i] k 'with you f.s.'

iii.



---> m [u] t l i m

'what shall I sow?'

The unsyllabified vowel, (X_i), in each case triggers disassociation of R_i and syllabification proceeds correctly. In the third example, R_i is disassociated (after disassociation of the glottal stop - cf. 1.6.1.1. and 3.1.2.2.1.) and the correct result is reached by allowing Universal Association Conventions (0.4.1.1.2.1.) to apply as the feature previously associated with R_i spreads onto the empty rhyme-headed X slot (cf. Pulleyblank 1988:243). This is diagrammed below.

```
      R
      |
      X
     .
[+F]
```

By stating that [a] has no feature specifications at the point where relevant rules apply, the statement regarding vowel deletion is greatly simplified.

Evidence from vowel deletion processes, together with consideration of the anaptyptic vowel, suggests that the NSV is that vowel which is realised by default as [a]. In harmonising environments, the NSV is the target of assimilation and may receive feature specification from a contiguous vowel, or, as in the case of the imperfect prefix, from an adjacent consonant. It is therefore proposed that [a] is the default realisation of the NSV in Hubaiʃi.

2.4.2.2. Gabiini and Kusmi:

Observation of vocalic asymmetries in the Raimi dialects shows that it is likewise /a/ which behaves asymmetrically within the vocalic system.

2.4.2.2.1. Epenthesis:

When the concatenation of two morphemes results in an unsyllabified consonant, the unsyllabified consonant triggers insertion of a rhyme-headed X slot. The vowel which associates with this X slot is realised either as [u] or as [a]. The following data are attested for Gabiini and Kusmi:

i. /b a i t + k u m/	-->	b e e t [u] k u m	'your m.pl. house'
ii. /b i n t + n a a/	-->	b i n t [a] n a a	'our daughter'
iii. /^{C} a n d + n a a/	-->	^{C} a n d [a] n a a	'with us'

iv. /^{c}a n d + h a n/	-->	^{c}a n d [a] h a n	'with them f.'
v. /ʃ i m i h k + n i i/	-->	ʃ i m i h k [a] n i i	'you m.s. saw me'

The epenthetic vowel in i., where the suffix vowel is /u/, is realised as [u]; since in all cases where the suffix vowel is not round the epenthetic vowel is realised as [a] it appears that the realisation in i. can be explained as an instance of [+R] spread.

If the utterance-final structure conditions noted in chapter one are considered, it is seen that the vowel inserted to split an illicit final consonant cluster is realised as either [a] or as [u]:

i. /q a b l/	-->	q a b [a] l]φ	'before' (Gab.)
ii. /d u x l/	-->	d u x [u] l]φ	'entry'
iii. /ʃ i ^{c}r/	-->	ʃ i ^{c}[a] r]φ	'poetry'
iv. /ʃ u ^{c}l/	-->	ʃ u ^{c}[u] l]φ	'work'
v. /ʃ a h r/	-->	ʃ a h [a] r]φ	'month'
			(and cf. 1.3.1.1.2.)

Again, note that [u] (in ii. and iv.) is restricted to the harmonising environment of /u/. Rather than write ad hoc rules stating that the epenthetic vowel is realised as [u] in the environment of /u/, and as [a] in the environment of /i/ or /a/, it is suggested that a vocalic position is epenthesized only and the NSV associates to be realised as [a] unless harmonising features spread from an adjacent segment , as in:

[+R]

b i n t V k u m ---> b i n t [u] k u m 'your m.pl. daughter'

In Kusmi, kaan 'to be' functions as a particle to which the object pronoun is suffixed. In case the suffix is consonant-initial, insertion of a rhyme-headed X slot is triggered by the unsyllabified consonant of the kaan morpheme. Either [a] or [u] subsequently associates with the inserted rhyme-headed X slot:

i.	/k a a n + h u m/ -->	k a a n [u] h u m	'they are/were'
ii.	/k a a n + k u m/ -->	k a a n [u] k u m	'you pl.m. are/were'
iii.	/k a a n + n a a/ -->	k a a n [a] n a a	'we are/were'
compare:			
iv.	/k a a n + i i/ -->	k a a n i i	'I am/was'
v.	/k a a n + u h/ -->	k a a n u h	'he is/was'

The round vowel variant (in i. and ii.) can again be explained as the result of this vowel being the target of right-to-left [+R] spread.

As in Hubaiʃi (cf. 1.7.3.1.2. and 2.4.2.1.1.1.), when insertion of a rhyme-headed X slot is triggered by an unsyllabified consonant across words, [a] invariably associates with this slot in Gabiini and in Kusmi:

/b i + ʃ a k l + ^{c} a a m/ -->	b i ʃ a k l [a] ^{c} a a m	'in a general way'
/ʃ i m i h + k + b u n d u q/ -->	ʃ i m i h k [a] b u n d u q	'you m.s. saw a gun'

2.4.2.2.2. Assimilation:

Not only is the NSV that vowel which associates with epenthesised rhyme-headed X slots, but also it is that vowel which is likely to be the target, but never the trigger of assimilation processes. When the future particle /k/ (restricted to the (first singular) inflectional forms in Raimi dialects) is prefixed in Kusmi and Gabiini, the vowel of the imperfect prefix is realised, not as [a], but rather as [u], viz:

/k + ? a k t u b/	-->	k [u] k t u b	'I will write'
/k + ? a T b u x/	-->	k [u] T b u x	'I will cook'

2.4.2.2.3. Deletion:

Deletion processes are far less prevalent in Kusmi and Gabiini than in Hubaiʃi; however, when vowel deletion does take place, either by means of syncope or by means of R_i disassociation, it is only [a] which systematically deletes. Consider the following instances of R_i disassociation:

/m a a + i s m i ʃ/	-->	m [i] s m i ʃ	'what's your f.s. name' (Gab.)
/m a a + i s m a k/	-->	m [i] s m a k	'what's your m.s. name'

Consider, also, the following instances of syncope:

/? a n a + k + ? a s i i r/	-->	? a n a [k s] i i r	'I will go'
/k a t a b a t + u h/	-->	k a t a [b t] u h	'she wrote it m.'

Additional support for the proposal that [a] constitutes the default realisation of the NSV in all three dialects is seen in the realisation of the definite article, the conjunction 'and' and the relative pronoun. It is noted that the vowel of the definite article and the relative pronoun in initial position generally corresponds to the minimal vowel in modern Arabic dialects (not, however, in Modern Standard Arabic, nor, it is assumed, in Classical Arabic). In Cairene, the vowel of the definite article and the relative pronoun in initial position is realised as [i]:

[i] l 'the' and [i] l l i 'relativiser' (and cf. Broselow 1976:27)

and the epenthetic vowel is likewise realised as [i]. In the Raimi dialects, the vowel of the definite article, and of the relative pronoun in utterance-initial position, and of the conjunction 'and' before a consonant, is realised as [a], viz:

[? a] l 'the' [? a] l l a dh i i 'relative pronoun' w [a] 'and'

In Hubaiʃi, the definite article is similarly realised as [?a]l, and the relative pronoun is realised alternatively as dhii or [?a]dhii in utterance-initial position, and the conjunction 'and' is realised as w[a] before a consonant.

It is concluded that the realisation of the NSV, only in case the spread of harmonising features does not take place, is [a] in Kusmi and Gabiini as in Hubaiʃi.[1]

2.5. The underspecified vocalic matrix:

It is necessary to provide an underspecified matrix in which [a] is presented as the default realisation of the NSV such that redundancy rules apply to give:

Redundancy rules:

C.R.	[ ] -----> [-R]
C.R.	[ ] -----> [-H]
C.R.	[ ] -----> [-P]
D.R.	[ ] -----> [+G]/[____, -R,-P]
C.R.	[ ] -----> [-G]

2.5.1. The features [G] and [R]:

Consider a matrix in which the two features marked are [G] and [R]:

1. Note that this contrasts with Classical and Modern Standard Arabic where the epenthetic vowel is generally assumed to be realised as [i]; the post-lexical NSV in MSA and in CA would be therefore said to have a default realisation of [i].

	a	i	u
G	+	–	–
R	–	–	+

This would constitute the fully specified matrix. When all redundant feature-values are removed, complement rules predictably supply [-R] (which is required) but also [-G] where the default specification required for this feature is [+G]. The incorrect result obtains regarding the default realisation of the NSV - providing [i] - as in:

	a	i	u
G	+		
R			+

Let us change the features. Since [R] is distinctive, [R] remains. The non-distinctive feature [G] is removed. In its place, [P] is inserted:

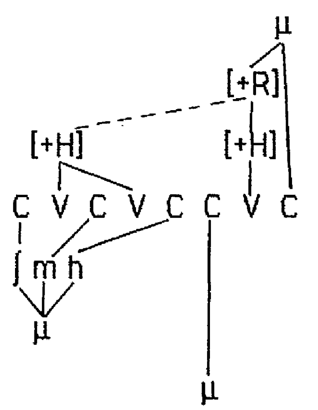
2.5.2. The features [P] and [R]:

	a	i	u
P	–	+	–
R	–	–	+

Once feature-values which may be supplied redundantly have been removed, the following underspecified matrix is left:

	a	i	u
P		+	
R			+

This matrix has the advantage of correctly distinguishing the NSV from the other two vowel phonemes. It states that distinctive features in the vocalic system are [P] and [R]. It provides one feature-value for each marked vowel and one specification for each feature. [P] and [R] are, however, not the most economical of feature combinations. [P] and [R] do not illuminate the similarity between /u/ and /i/. For example, insight into certain processes of 'parasitic' harmony (cf. 8.3.5.1.1.) where [+R] spreads from a [+H,+R] trigger onto a [+H] target, is not provided, viz:



(third masculine singular)

morphological template

consonantal melody

(second masculine singular)

The realised output of this process is:

ʃ [u] m [u] h k u h 'you m.s. saw him' (cf. 2.4.1.2.)

The matrix with [P] and [R] as distinctive features has the additional disadvantage of not affording insight into the hierarchy of strength evident between the vocalic phonemes in these language systems:

u > i > a (cf. Goitein 1960:18/368)

Since it has been shown that [R] is distinctive in these language systems, the feature [R] is maintained. Consider now the ultimate option where [P] is replaced by [H] – for the NSV is not only neither [+P] nor [+R], but neither is it [+H].

2.5.3. The features [H] and [R]:

	a	i	u
H		+	+
R			+

This particular matrix supplies the correct NSV - allowing complement rules to supply [-H] and [-R]. It also provides insight into the relationship between [+H] and [+R]. However, it does prove infelicitous in that one phoneme is positively marked twice, while one feature bears two positive stipulations: three feature specifications where only two are possible weakens the argument (Archangeli 1984a:48). On the one hand, however, this need not deter us, since indications are that the feature [H] is less marked than the feature [R], and that the doubly specified [+H,+R] phoneme is the most highly marked vowel in this language system - as is frequently the case. This matrix, therefore, has the advantages of:

a) reflecting the vocalic strength hierarchy: u > i > a, as below:

```
  u    i    a
  |    |
[+H] [+H]
  |
[+R]
```

b) reflecting the feature strength hierarchy: [R] > [H];

c) providing insight into productive phonological processes of 'parasitic' harmony - which are evident in Hubaiʃi and Kusmi, but are particularly prevalent in Kusmi (cf. 8.3.5.1.1.).

On the other hand, the number of feature specifications in the matrix may be reduced still further, for the matrix is still not devoid of redundant information. [+H] is not distinctive for /u/, since [+H] will be inserted for this phoneme by universal default rule, viz:

D.R. $[\ \ ] \longrightarrow [+H]/[\_\_\_,+R]$

The non-redundant matrix now appears as below:

	a	i	u
H		+	
R			+

2.5.4. Complement rules and universal default rules operate to fully specify vowels as follows:

D.R. [ ] ---> [+H]/[___,+R]

	a	i	u
H		+	[+]
R			+

C.R. [ ] ---> [-R]

C.R. [ ] ---> [-H]

	a	i	u
H	[-]	+	[+]
R	[-]	[-]	+

Values for any remaining features (i.e. features needed on the consonantal tier) are filled in by the following redundancy rules:

D.R. [ ] ---> [+P]/[___,+H,-R]

C.R. [ ] ---> [-P]

D.R. [ ] ---> [-G]/[___,+P/+R]

C.R. [ ] ---> [+G]

The matrix is affected as below:

	a	i	u
H	–	+	+
R	–	–	+
P	[–]	[+]	[–]
G	[+]	[–]	[–]

The fully specified matrix is now identical to that for language systems where the non-specified vowel has a default realisation of either [i] or [u]. Note that while [P] and [G] are distinctive for consonants, and, therefore, underlyingly represented in the consonantal system, values for them are derived by default in the vocalic system. The underlying distinctiveness of a feature within one system does not necessarily render it distinctive in a second system: although the features [G] and [P] are derived and, therefore, are not distinctive here, they are needed to account for consonants[1.] and, also, to account for the interaction between the consonantal and the vocalic systems.

In this chapter, I have considered the number and identity of vocalic features at the segmental level and at the level of lexical representation. To this end, I have considered the segmental class of 'glides'. On the basis of evidence from syllable and phrase-structure conditions, the high glides, 'w' and 'j', in conjunction with the laryngeals 'h' and '?', have been classified as 'non-syllabic vocoids'. In examining the asymmetric behaviour of one vowel phoneme, the non-specified vowel has been determined for the dialects under examination. Although, in this case, all three dialects share the NSV, one of the ways in which underspecification theory can account for dialectal variation is by determining which one out

1. [G] is seen to be distinctive on the consonantal tier in the lexical component (cf. 5.8.), but is assigned by default in the post-lexical component (cf. 5.9.1.).

of a number of possible permutations of features in combination should be resorted to in the underlying matrix. Dealing with identical inventory systems, there is more than one way by which to attain the same fully specified result. The means by which the final matrix is reached are determined, not only by considerations of language universals, but also, and as importantly, by the particular language system. It is seen that the underspecified matrix is used, not simply as a means to reduce the number of features and feature-values to a minimum, but to do so in order to capture generalisations of the language and express them with maximal efficiency and simplicity.

CHAPTER THREE

The Consonantal System

Having established the identity of the post-lexical NSV in chapter two (the default realisation of which, as will be seen in chapter five, is the same in the lexical component), the main concern of this chapter is to establish the default realisation of the post-lexical NSC; the other concern is to determine, as far as is possible at this stage, the identity of distinctive features in the consonantal matrix. Since redundancy rules are withheld from application for as long as possible - subject to the Redundancy Rule Ordering Constraint (0.4.1.4.4.1.1.) - the underspecified matrix established in this chapter is assumed to be that which is generally available at the beginning of the post-lexical component.

The chapter is divided as follows: the initial section will be devoted to establishing the default realisation of the NSC by considering asymmetrical characteristics of a non-specified segment at the post-lexical level. Consonant epenthesis will be considered in terms of consonant prothesis, and rhyme branching in utterance-final position. At this stage, it will be observed that the NSC has a default realisation of either [ʔ] or [h]. In Kusmi and Gabiini, [h] appears to be more frequently realised than [ʔ] as a result of epenthesis in utterance-final position. In Hubaiʃi, [ʔ] and [h] appear to be freely variable in this position. I shall then look at the deletion of lexical laryngeals in Hubaiʃi and Gabiini and Kusmi; while /ʔ/ has more propensity to deletion than /h/, in particular, in the Raimi dialects, deletion of both laryngeals is attested in all three dialects. Since [ʔ] and only [ʔ] associates with prothesised X slots, however, the post-lexical NSC is said to have a default realisation of [ʔ]. By establishing [ʔ] as the default realisation of the NSC for all three dialects, it is still necessary to explain the appearance of [h] in utterance-final position. Looking at the feature which distinguishes [h] from [ʔ] - namely [+continuant] - and noting the propensity of the NSS to be the target of assimilation, it is claimed that spread of [+continuant] ([+Ct]) occurs optionally at a low level in the derivation from a vowel onto the adjacent NSC. This process is formalised as [+Ct] spread.

Having established the default realisation of the NSC, I turn to examine those features which appear to be distinctive in the consonantal system at this stage. I shall present the consonantal matrix for the dialects and propose the redundancy rules required to derive segments. Finally, the features are represented as terminal nodes on the feature matrix tree.

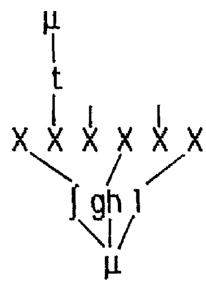
3.1. The NSC

3.1.1. Consonant epenthesis:

As a first stage in establishing the default realisation of the post-lexical NSC I shall consider processes of consonant epenthesis. Consonant epenthesis in the dialects takes the form of prothesis and anaptyxis as observed for vowels (cf. 2.4.2.1.1.) as well as consonant epenthesis in utterance-final position (i.e. rhyme branching, cf. 1.3.2.1. and 2.1.1.1.2.). Of these epenthetic processes, prothesis and rhyme branching will be examined in the present instance; anaptyxis is the least common epenthetic process as far as consonants are concerned (cf. 1.7.2.3.) and will not be handled again in this chapter.

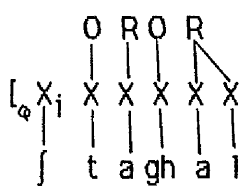
3.1.1.1. Prothesis:

The syllabification mechanism will frequently project either $\overset{|}{X}$ or X in case an impermissible sequence of segments is encountered (cf. 1.7.1.1., 1.7.1.2. and 1.7.2.3.): if the morphology concatenates an impermissible sequence of consonants, the mechanism may delete a consonant (by means of laryngeal disassociation cf. 1.6.1.1.1. and 1.6.2.3.) or project a rhyme-headed X slot (cf. 1.7.3.1.); if, on the other hand, an impermissible sequence of vowels is juxtaposed, the mechanism may delete a vowel (by means of R_i disassociation cf. 1.7.2.1.), or project a non-rhyme-headed X slot (cf. 1.7.2.3.). When, for example, the Hubaiʃi form <u>ʃtaghal</u> 'he worked' occurs in utterance-initial position, an impermissible sequence of consonants occurs, viz:



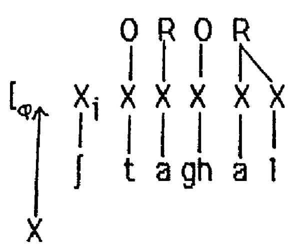
consonantal root

Syllabification applies, and in utterance-initial position, the initial consonant is unsyllabified:



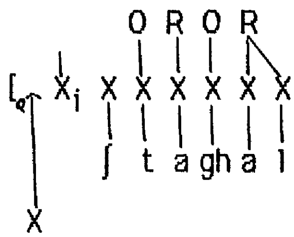
The unsyllabified consonant triggers prothesis of a rhyme-headed X slot:

Vowel prothesis:



The output of this process, however, is still distinct from the syllable template established for the dialects. Since the minimal syllable is CV - i.e. it comprises an onset and a rhyme - a non-rhyme-headed X slot is prothecised to provide the requisite onset:

Consonant prothesis:



Redundancy rules operate to realise:

$[_\sigma$[? a] ʃ t a gh a l 'he worked'

This is corroborated by McCarthy's observations for Classical Arabic that:

> 'forms with initial clusters, if not preceded by a V in the phrase, receive epenthetic ?V' (McCarthy 1985:243)

The output now conforms to the Well-formedness Condition for syllabification by being non-distinct from the syllable template (1.5.1.).

An onset precedes every rhyme. When the morphology creates an impermissible consonant sequence in utterance-initial position, a rhyme-headed X slot will be inserted prothetically. This produces an initial rhyme. Since an onsetless rhyme defies the Well-formedness Condition for syllabification, the unsyllabified vowel triggers insertion of a non-rhyme-headed X slot. [?] invariably associates with the prothesised non-rhyme-headed X slot. This process is observed in the following examples. Representations are given on the left followed by the (hypothetical) output of vowel prothesis and the output of consonant prothesis:

Hubaiʃi:

/l + b u n i j j i/ --> *$[_{\varphi}$[a] l b u n i j j i --> $[_{\varphi}$[?] a l b u n i j j i 'the girl'

/T l a ^{C}/ --> *$[_{\varphi}$[a] T l a ^{C} --> $[_{\varphi}$[?] a T l a ^{C} 'go up! m.s.'

/ʃ t a r i/ --> *$[_{\varphi}$[a] ʃ t a r i --> $[_{\varphi}$[?] a ʃ t a r i 'he bought'(H)

Kusmi and Gabiini:

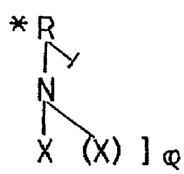
/l + w a l a d/ --> *$[_{\varphi}$[a] l w a l a d --> $[_{\varphi}$[?] a l w a l a d 'the boy'

/T l a ^{C}/ --> *$[_{\varphi}$[a] T l a ^{C} --> $[_{\varphi}$[?] a T l a ^{C} 'go up! m.s.'

/ʃ t a r a/ --> *$[_{\varphi}$[a] ʃ t a r a --> $[_{\varphi}$[?] a ʃ t a r a 'he bought'

3.1.1.2. Rhyme branching in utterance-final position:

While the syllable template does permit open syllables within the utterance, a segment linked directly to the nucleus of a rhyme does not occur in utterance-final position (cf. Fischer and Jastrow 1980:111). This negative condition is repeated below:



(cf. 1.4.5.4)

In chapter two, it was seen that there are two principal ways in which syllable structure is repaired in these dialects should a morpheme with a final short vowel juxtapose an utterance-final boundary: bare nucleus deletion (preceded by feature disasssociation or complex consonant formation), and insertion of a non-rhyme-headed X slot with which [h] or [?] subsequently associates. In determining the default realisation of the NSC, the behaviour of morphemes with final short vowels in utterance-final position is particularly revealing.

Having dealt with bare nucleus deletion (2.1.1.1.1.), feature disassociation (2.1.1.1.1.1.) and complex consonant formation (2.1.1.1.1.2.), interest is restricted here to utterance-final rhyme-branching. It is observed that when the final (unsyllabified) vowel of an utterance triggers insertion of a non-rhyme-headed X slot, just as [h] generally associates with the inserted slot in Classical Arabic - in particular, in indeclinable words such as kaifa 'how' and thumma 'then' (which are realised as kaifa[h]$]_{\varphi}$ and thumma[h]$]_{\varphi}$) (cf. Birkeland 1940, Zamakhshari 1879:162, Wright 1971:372) - so [h] generally associates with the inserted slot in Kusmi and Gabiini, and [h] or [?] associate with the inserted slot in Hubaiʃi. Jastrow, having dealt with the case of long high vowels in utterance-final position, states that, for the dialects of Gibla and Jariim:

> 'die übrigen Vokale müssen wortauslautend in Pausa entweder von h oder ? gefolgt sein . . . g i ? n a $]_{\varphi}$ ---> g i ? n a ? $]_{\varphi}$
>
> t i w a l l a $]_{\varphi}$ ---> t i w a l l a h$]_{\varphi}$
>
> (Fischer and Jastrow 1980:111)

Behnstedt claims for the Yemeni dialects spoken around Sa^{C}da, that, while all long vowels are diphthongised, short vowels 'werden in Pausa meist durch -h beschlossen' (Behnstedt 1987:19). Rossi also noted for San^{C}aani a final 'non-etymological' [h] 'es. huh 'egli' per hu, hih 'esse' per hi' (Rossi 1939:5).[1] Consider the following data for the dialects. Representations are given on the left, utterance-final realisations are given on the right:

Hubaiʃi:

/? a i w a/	--->	? e i w a [?]/[h] $]_{\varphi}$	'yes'
/m a d r a s a/	--->	m a d r a s a [h]/[?] $]_{\varphi}$	'school'

1. Pausal glottalisation affects vowels in poetry and in prose in Classical Arabic, though, in contrast to the dialects examined here, this is not restricted to short vowels in CA (Weil 1905/6:44, Zamakhshari 1879:162.5).

/s i m i ^{C} + i/	--->	s i m i ^{C} i [h]/[?] $]_{\varphi}$	'she heard'
/k a b i i r + i/	--->	k a b i i r i [h]/[?] $]_{\varphi}$	'big, old f.s.'
/h a a dh a k a/	--->	h a a dh a k a [?] $]_{\varphi}$	'that m.s.'
/l a/	--->	l a [?] $]_{\varphi}$	'no'

Kusmi and Gabiini:

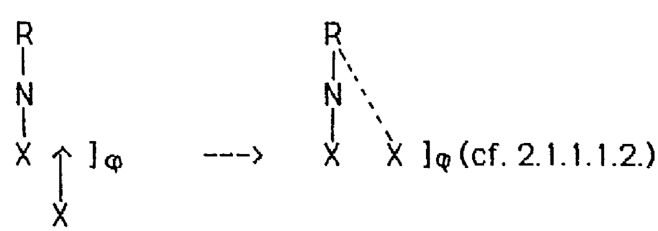
/? a i w a/	--->	? e e w a [h] $]_{\varphi}$	'yes'
/m a t a/	--->	m a t a [?]/[h] $]_{\varphi}$	'when'
/l i m i/	--->	l i m i [h] $]_{\varphi}$	'why'
/m a s g u u n a/	--->	m a s g u u n a [h] $]_{\varphi}$	'imprisoned f.s.'

It will be observed that in utterance-final position long and short /a/ may be neutralised to [ah] or [a?] in all three dialects (and cf. 2.1.1.2.2.); for example:

/^{C} a l a m a a/	-->	^{C} a l a m a [?]/[h] $]_{\varphi}$	'why' (Kus./Gab.)
/m a d r a s a/	-->	m a d r a s a [h] $]_{\varphi}$	'school' (Kus./Gab.)
/m a d r a s a/	-->	m a d r a s a [h]/[?] $]_{\varphi}$	'school' (Hub.)
/? a b S a r n a a/	-->	? a b S a r n a [h]/[?] $]_{\varphi}$	'we saw' (Hub.)
/w a l l a/	-->	w a l l a [h]/[?] $]_{\varphi}$	'she went' (Hub.)

Rhyme branching is diagrammed as below:

Rhyme branching:



In Hubaiʃi, when a short vowel occurs in utterance-final position speakers will often alternate freely between pronouncing final [h] or [?]. Whether a final laryngeal is realised as a fricative or as a glottal stop is frequently a matter of personal characteristics of speech. Some speakers are more inclined to final glottalisation – in particular older women – other speakers are more inclined to final aspiration. In Gabiini and Kusmi, [h] is more frequently associated with a slot epenthesised in utterance-final position than [?].

Laryngeal rhyme branching is not restricted to Yemeni dialects. Rhyme branching is noted in dialects spoken in other parts of the Arab world. Discussing the speech of the ʃukrijja in Sudan, Reichmuth states for long vowels:

> 'Lange Vokale in offenen Endsilben werden im Auslaut gewöhnlich als [vh*] realisiert:
>
> | | | |
> |---|---|---|
> | /faki:/ | [fa'kih*] | 'religiöser Mann' |
> | /le:/ | ['leh*] | 'zu ihm'' (Reichmuth 1983:57) |

/a/, on the other hand, will be glottalised in utterance-final position:

> '/a/ in offener Endsilbe wird daneben häufig mit Glottalverschluß artikuliert, insbesondere bei einsilbigen Wörtern: ['ja?*] 'er kam' ['ma?*] 'Wasser' '
> (Reichmuth 1983:61)

The realisation of a glottal stop to the right of utterance-final short vowels is not to be confused with the glottalisation or aspiration of utterance-final consonants. This latter (which will be dealt with in further detail in the Appendix) is seen to be stress dependent (cf. A.2.3.), while the realisation of a glottal stop or laryngeal fricative after short vowels is not dependent on stress.

3.1.2. Deletion of lexical laryngeals:

Processes of consonant epenthesis have been considered where an unsyllabified vowel triggers insertion of a non-rhyme-headed X slot in order to produce a structure which is non-distinct from the syllable template established for the dialects. In establishing the identity of the non-specified vowel of a language it was observed, however, that not only insertion processes must be examined, but also deletion processes. As Hooper suggests, 'stress languages . . . delete the minimal vowel' (Hooper 1976:236, cf. also 2.4.2.1.2.). Frequently it does appear to be characteristic of the NSS that, of all segments of its prosodic type, this segment is most prone to deletion. This phenomenon is not valid for the lexical congener of the epenthetic vowel only, but also for the lexical congener of the epenthetic consonant. To this end, in chapter one it has been observed that the initial laryngeal proves to be the weak phoneme both in cases where its realisation would violate syllable structure, and in cases where its non-realisation would not violate syllable structure (cf. 1.6.1.1., 1.6.2. and 1.7.3.2).

3.1.2.1. /h/ disassociation in Hubaiʃi:

In Hubaiʃi, /h/ of the independent and demonstrative pronouns is subject to laryngeal disassociation when preceded by a consonant, and resyllabification takes place, as in the following instances:

/m a n + h u/	'he' --->	.m a. n u.	'who is he?'
/ʔ a i n + h i/	'she' --->	.ʔ e i. n i.	'where is she?'
/m i n + h u u n a/	'here' --->	.m i. n u u. n a	'from here'
/m i n + h u n a a k a/	'there' --->	.m i. n u. n a a. k a	'from there'
			(cf. 1.6.1.1.)

/h/ is also disassociated when preceded by a vowel, as in the examples below:

/^{c} a l a + h a a dh a a/	'this m.s.'	--->	.^{c} a. l a a. dh a a.	'on this'
/ ^{c} a l a + h a a k a/	'thus'	--->	.^{c} a. l a a. k a.	'like that'

3.1.2.2. The phonemic status of the glottal stop in Hubaiʃi:

Laryngeal disassociation applies, not only to the laryngeal fricative, but also to the glottal stop. Deletion of the glottal stop is characteristic, not only of Modern Arabic dialects[1], but is also attested in the papyri of Early Arabic (tenth century A.D.). Hopkins observes that:

> 'For all practical purposes it can be stated quite plainly that in the language of the early papyri hamza, the glottal stop, barely exists, being weakened to such an extent as to be disregarded completely . . . or absorbed into the categories of words containing <u>w</u> or <u>y</u>.' (Hopkins 1984:19)

Firstly, it must be observed that, in contrast to the majority of modern Arabic dialects[2], in Hubaiʃi, Kusmi and Gabiini, the glottal stop is maintained as a phoneme in its own right in common with the majority of dialects spoken in the Yemeni western mountain range (Rossi 1937:235, Diem 1973, Fischer and Jastow 1980:106, Behnstedt 1985). Jastrow says:

> 'Aar. ? (hamza) ist im Bereich der jemenitischen westlichen Bergketten als Phonem erhalten. Es ist nicht, wie sonst

1. Wetzstein notes for the dialect spoken by Syrian nomads in the mid-nineteenth century that the sounds /?/, /w/ and /j/ have weakened and often disappear. Of these, the glottal stop (hamza) is the weakest (Wetzstein 1868:168).
2. Beeston notes that one of the differences between the Meccan dialect of the early seventh century and East Arabian dialects was that the consonantal hamza had ceased to be part of the phonemic repertory of the Meccan dialect (Beeston 1970:26).

allgemein im Neuarabischen, im Wortinnern elidiert worden.' (Fischer and Jastrow 1980:106-7)

The lexical occurrence of the glottal stop is, however, infrequent in comparison to other phonemes in the consonantal inventory.

The following forms are attested in Hubaiʃi:

g u [?] k			'I came'
g a [?] k			'you m.s. came'
g a a [?] a			'she came' (cf. Behnstedt 1985:157)
r a [?] s	pl.	r u [?] u u s	'head' (noun)
[?] a k k a l			'he ate'
[?] a s a a s			'basis'
[?] a g l			'sake'

3.1.2.2.1. /?/ disassociation in Hubaiʃi:

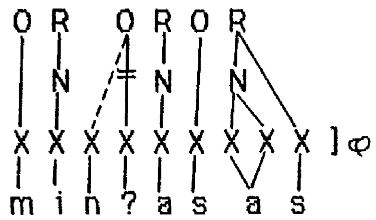
When the lexical glottal stop is word-initial, it is not generally pronounced within the utterance in Hubaiʃi, being restricted to utterance-initial position. Deletion of the initial lexical glottal stop is also attested by Jastrow for Gibla (Fischer and Jastrow 1980:111). Consider the derivation of 'from/on the basis (of . .)' where a glottal stop is immediately preceded by a consonant:

input:

/m i n + ? a s a a s/

/?/ disassociation applies followed by resyllabification, viz:

/?/ disassociation:



/n/ of /min/ is incorporated as the onset of the second syllable, to provide the following fully syllabified output:

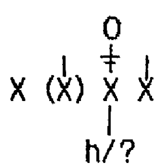
. m i . n a . s a a s.]φ 'from/on the basis (of . .)'

As with the laryngeal fricative, the glottal stop is disassociated, not only to the right of a consonant, but also, to the right of a vowel, as in:

/j a a + ? u m m i i/	-->	.j u m. m i i.	'hey mum!'
/? i l a + ? a i n/	-->	.? i .l e i n.	'to where?'

Laryngeal disassociation is generally formalised as below:

Laryngeal disassociation:



(cf. 1.6.1.1.1.)

3.1.2.3. The glottal stop in Kusmi and Gabiini:

As in Hubaiʃi, the glottal stop does constitute a phoneme in the Raimi dialects, but its occurrence is far more limited in these dialects than in Hubaiʃi. /?/ is realised as C_i of the consonantal root in the following words:

[?] a m s	'yesterday'
[?] e e n	'where'

[?] a s a a s	'basis'
[?] a t a	'he came'

And is optionally realised as C_{ii} in:

dh i [?] b / dh i i b		'wolf'
r a [?] s / r a a s	pl. r u [?] u u s / r u u s	'head'
b i [?] r / b i i r		'well'
b u [?] s / b u u s		'courage'

And is realised as C_{iii} in the following verbal forms:

q a r a [?]	'he read'	j a q r a [?]	'he reads'
(? a) f t a g a [?]	'he was surprised'	j i f t a g i [?]	'he is surprised'

However, in contrast to Hubaiʃi, /?/ is not realised as C_{iii} in any of the inflected forms of the above verb type. It appears that the weakness of the glottal stop caused the partial merging of final hamzated words with third weak verbs in these dialects (and cf. Hopkins for Early Arabic 1984:21). Consider the following paradigms of the final hamzated verb qara? 'he read' and the third weak verb ?ata 'he came' in Gabiini and Kusmi. Any discrepancy between the two dialects is noted in the left-hand gloss:

final hamzated		final weak	
q a r a ?	'he read'	? a t a	'he came'
q a r o o [k^W]	'I read' (Kus.)	? a t o o [k^W]	'I came'
q a r e e k	'I read' (Gab.)	? a t e e k	'I came'
q a r e e [tʃ]/[k_j]	'you f.s. read' (K.)	? a t e e [tʃ]/[k_j]	'you f. came'
q a r e e ʃ	'you f.s. read' (G.)	? a t e e ʃ	'you f. came'
q a r e e k	'you m.s. read'	? a t e e k	'you m.came'

q a r e e n a a	'we read'	? a t e e n a a	'we came'
q a r i t	'she read'	? a t i t	'she came'
q a r u u	'they m. read' (G.)	? a t u u	'they came'
q a r u m	'they m. read' (K.)	? a t u m	'they came'

/?/ is also not realised as C_i in the imperfect inflected forms of initial hamzated verbs:

[?] a t a 'he came'

but

t a a t i i 'you f.s. come'

j a a t i i 'he comes'

n a a t i i 'we come' (cf. Diem 1973:88)

However, in the case of 'to eat', the following variants are attested in both Raimi dialects:

j a [?] k u l/j [a a] k u l 'he eats'

t a [?] k u l/t [a a] k u l 'you m.s. eat'

3.1.2.3.1. /?/ disassociation:

Disassociation of the lexical glottal stop to the right of a consonant constitutes the general case in Kusmi and Gabiini, as illustrated in the following instances, viz:

/q a b l + ? a m s/	--->	.q a b .l a m s	'the day before yesterday'
/m i n + ? a i n/	--->	.m i .n e e n	'from whence'
/m a n + ? a n t a/	--->	.m a .n a n .t a.	'who are you m.s.?'

And disassociation of the lexical glottal stop to the right of a vowel (followed by R_i disassociation, cf. 1.7.2.1.) is more frequently attested than its realisation in this position, as in:

/m a a + ? a n a a/ ---> .m a .n a a. 'I not . .'

/^{c}a l a + ? a s a a s/ ---> .^{c}a .l a .s a a s 'on the basis of . .'

/? i l a + ? a i n/ ---> .? i .l e e n 'to where?'

3.1.2.4. /h/ disassociation:

While disassociation of the laryngeal fricative is possible in rapid speech, in general, initial /h/ of the demonstratives is maintained within the utterance in contrast to the weak demonstrative /h/ in Hubaiʃi, as in:

m i n [h] a a n a l a . .	'from here to . . '
^{c}a l a [h] a a dh a a	'on this m.s.' (Kus.)
^{c}a l a [h] a a Dh a a	'on this m.s.' (Gab.)

The /h/ of the ((third person)) independent pronouns, however, is subject to disassociation in the Raimi dialects when preceded by a consonant, as noted in chapter one (cf. 1.6.2.1. and 1.6.2.3.), viz:

/m a n + h u/	--->	.m a .n u.	'who is he?'
/m a n + h i/	--->	.m a .n i.	'who is she?'
/m a n + h u m/	--->	.m a .n u m.	'who are they m.?'
/? a i n + h i/	--->	.? e e .n i.	'where is she?'

Laryngeal disassociation is generally formalised in these dialects as below with the stipulation that, 'where /h/ is involved, /h/ is the first element of one of the (third) independent pronouns' (cf. 1.6.2.3.). This suggests that laryngeal disassociation, as it affects /h/, is a lexical process:

Laryngeal disassociation:

```
           O
        |  |  |
X  (X)  X  X
           |
          h/?
```

3.1.3. Glottal stop prefixation at the derivational level:

In all three dialects, the lexical glottal stop need not only be part of the consonantal root, but may also be realised with a morphological function. In all three dialects, a prefixed glottal stop indicates [first singular] in the imperfect aspect of the verb:

μ	[first]
C V C C V C	imperfect

as in:

[?] a g l i s	'I sit'	consonantal root: gls
[?] a k t u b	'I write'	consonantal root: ktb

In the formation of derived verb forms (or binyanim), root consonants may be geminated, vowels may be lengthened or inserted and/or non-root consonants may be inserted. In Hubaiʃi, and to a lesser extent in Kusmi and Gabiini, the traditional Classical Arabic form IV verb type is attested[1.], where [?a] form the initial pre-root segments:

[?] a b S a r	'he saw'
[?] a th m a r	'it bore fruits'
[?] a ^{C} g a b	'he/it pleased'

In all three dialects, in common with most if not all Arabic speech varieties, [?a] form the initial pre-root segments in the elative forms:

[?] a k th a r	'more'
[?] a z j a d	'more' (Hub.)

1. This verb form is attested in dialects spoken from Aden through North Yemen and also in Bedouin dialects. In other modern dialects of Arabic the form is rare (Fischer and Jastrow 1980:117). It often, though not always (as in the case of ?abSar 'he saw', below) carries the sense of causitivity (and cf. Behnstedt 1987: 33).

And in the broken plural pattern: X_i X X X X X X, the formative glottal stop associates with X_i. viz:

w a l a d 'boy' [?] a w l a a d 'boys'

3.1.3.1. Formative /?/ disassociation:

In context, the word-initial formative glottal stop is disassociated in all three dialects, just like the initial glottal stop of the consonantal root, viz:

/m u u + ? a k t u b/ ---> m [u] k t u b 'what should I write?' (Hub.)

/m a a + ? a d r i i/ ---> m [i] d r i i 'I don't know' (cf. 2.4.2.1.2.)

/m u u + ? a b S a r/ ---> m [u] b S a r 'what did he see?' (Hub.)

/? a i n + ? a w l a a d + u/ ---> ? e i n [a] w l a a d u? 'where are his children?' (Hub.)

/? a i n + ? a w l a a d + u h/ ---> ? e e n [a] w l a a d u h? 'where are his children?' (K./G.)

Post-vocalic disassociation of the formative glottal stop is not restricted to Yemeni dialects, Weil notes the formation of maqdar 'I cannot' from maa ?aqdar in colloquial Arabic, and saktub 'I will write' from sa ?aktub (Weil 1905:31/34). McCarthy also observes for Classical Arabic that:

> 'the intervocalic glottal stop and the following vowel are deleted in some binyan IV forms.' (McCarthy 1985:243)

The formative glottal stop is disassociated not only to the right of a vowel, but also to the right of a consonant. In Gabiini and Kusmi, when the /k/ future particle (restricted to [first singular]) is cliticised to the imperfect verb, the glottal stop of the [first singular] subject pronoun is disassociated (and the vowel to the left of the stem is realised as [u]):

/k + ? a k t u b/ ---> k [u] k t u b 'I will write' (Gab./Kus.)

And also, when speakers of all three dialects copy the Central Highlands and Northern use of the habitual aspect marker, /bain/ (restricted to {first singular}), the glottal stop of the {first singular} imperfect subject pronoun is disassociated, viz:

/b a i n + ? a x a z z i n/ --> b e e n a x a z z i n 'I am chewing qāt now' (Kus./Gab.)

/b a i n + ? a r S u d/ --> b e i n a r S u d 'I am writing' (Hub.)

Note that the laryngeal fricative of the independent pronouns in all three dialects, and the laryngeal fricative of demonstrative pronouns in Hubaiʃi is far more susceptible to disassociation than the laryngeal fricative of other lexical items. This suggests that in all three dialects laryngeal disassociation applies when /h/ is involved if and only if the relevant morphological information is present. Therefore, while disassociation of word-initial /?/ appears to be post-lexical, disassociation of /h/ is analysed as a lexical process.

3.1.4. The default realisation of the post-lexical NSC: [h] or [?]?

The asymmetric behaviour of the laryngeals: their post-lexical frequency, their lexical infrequency, and the propensity of lexical laryngeals - i.e. laryngeals associated with the consonantal root and laryngeals associated with the morphological pattern - to deletion in certain phonological environments does suggest that the default realisation of (at least) the post-lexical NSC in the dialects is laryngeal (and cf. Lass 1976:153 and 1984:115). The question is: which one? Although [h] occurs more frequently than [?] as a result of rhyme branching in utterance-final position in Kusmi and Gabiini, the weakness of the glottal stop in comparison to the laryngeal fricative suggests that it is [?] and not [h] which is the default realisation of the NSC in these two dialects. In Hubaiʃi, however, the weakness of both the laryngeal fricative and the glottal stop together with the apparent free variation of [h] and [?] in utterance-final position makes the default identity of the NSC not so instantly clear. In this dialect, following the application of redundancy rules, the NSC is realised as a laryngeal. But, is the default realisation of the Hubaiʃi NSC a particular laryngeal, or is it as any one of two laryngeals? That is to say, are [h] and [?] equally non-specified underlyingly?

3.1.5. The default realisation of the post-lexical NSC in Hubaiʃi:

Of the two laryngeals, in determining the identity of the least specified, predictability and frequency of occurrence must be considered. Firstly, [h] is realised in utterance-initial position only in case the lexeme is an independent or a demonstrative pronoun, and [h], in this case, constitutes a lexical phoneme, /h/, or, C_i of the consonantal root is /h/; in all other instances, [?] is realised. In addition, it is attested that a lexeme with an initial (lexical) laryngeal fricative in Hubaiʃi may be pronounced with a glottal stop in some environments. The converse is not attested: a lexeme with an initial glottal stop is never realised with an initial laryngeal fricative. Thus we hear:

(? i) t k a r b i s i i. [?] u u n a 'sit f.s. here!'

beside the expected variant:

(? i) t k a r b i s i i. [h] u u n a 'sit f.s. here!'

but the form:

*[h] a j j a n a ʃ k a l ?

is unattested beside:

[?] a j j a n a ʃ k a l ? 'which is the best?'

In the first case, it appears that 'h' is lexical (/h/) and may be deleted by laryngeal disassociation, as reviewed above (and cf. 1.6.1.1.1.). This leaves an onsetless syllable which then receives an empty X slot filled by the NSC which is realised, by default, as [?]. Together with evidence that [?] is realised in derived patterns, while [h] is never attested in derived patterns, and that [?] and only [?] will fill empty or epenthesised syllable-initial X slots, it is maintained that [?] represents the default value of the non-specified consonant at the post-lexical level.

The choice of [?] as the default realisation of the NSC in all three dialects, however, does not mean that we do not have to account for the occurrences of [h], and this will be dealt with now.

3.2. 'Free variation' of [h] and [?] in utterance-final position:

While the realisation of [?] in initial position is predictable in all three dialects, in utterance-final position, [h] is realised far more frequently than [?] in Kusmi and Gabiini, and, in Hubaiʃi, there is an optional realisation of [h] in positions in which [?] is expected. If the default realisation of the NSC is [?], and if it is the NSC which associates with the inserted X slot in utterance-final position, then it is necessary to explain the apparent free variation of Hubaiʃi:

m a x b a z a [h] $]_{\varphi}$ 'straw-stuffed pad for slapping bread on sides of the oven'

and m a x b a z a [?] $]_{\varphi}$ 'ditto'

? e i w a [h] $]_{\varphi}$ and ? e i w a [?] $]_{\varphi}$ 'yes'

And the realisation of [h] in utterance-final position in Gabiini and Kusmi as in:

m a d r a s a [h] $]_{\varphi}$ 'school' l i m i [h]]$_\varphi$ 'why?'

l u q m a [h]]$_\varphi$ '(small) loaf'

3.2.1. [+Continuant] spread:

Since it is not desirable to revert to the position of two default manifestations of the NSC, the realisation of [h] in this position must be accounted for. An explanation can be found in a [+continuant] ([+Ct]) spread rule: since [?] has all the characteristics of a non-specified segment, there must be at least one feature which distinguishes [h] from [?]. That feature is [continuant]. [h] is assigned the feature [+Ct] (and cf. Lass 1976:154); [?] redundantly lacks specification for [Ct]. Of those segments in the immediate vicinity of the inserted segment, the vowel to the left (and the initial laryngeal fricative as in the examples hu[h]]$_\varphi$ 'he' and hi[h]]$_\varphi$ 'she' given above) has the feature [+Ct] unconditionally (cf. Lass 1984:89). It is suggested, then, that [+Ct] spreads rightwards from a vocalic trigger onto the NSC target. The position adopted in the present case suggests that, whether the minimal consonant emerges as a stop or as a fricative in utterance-final position is dependent on the extent to which [+Ct] spreads from the preceding vowel at a low level in the derivation:

[+Ct] spread:

```
[+Ct]          [+Ct]
 |`\             |
 V  C  --->     [h]
```

In feature geometry terms, this representation can be diagrammed as below to illustrate how [+Ct] spreads from the manner node of the vowel to the empty manner node of the non-specified target, viz:

```
         [+Ct]
          ┌- - - -.
manner    X        X
          |        |
root      X        X
          |        |
          V        C
```

No other features of the vowel spread because features associated with the manner node can spread independently of features associated with the supralaryngeal node. The [h] variant is, therefore, a result of the NSC being the target of [+Ct] spread. Utterance-final rhyme branching followed by [+Ct] spread will produce [Vh], as in Hubaiʃi:

/k a t a b a/ --->	k a t a b a [h] $]_{\varphi}$	'she wrote'
/s i m i ^{C} i/ --->	s i m i ^{C} i [h] $]_{\varphi}$	'she heard'
/h u u n a/ --->	h u u n a [h] $]_{\varphi}$	'here'

And as in Kusmi and Gabiini:

/l u q m a/ --->	l u q m a [h] $]_{\varphi}$	'small loaf'
/l i m i / --->	l i m i [h] $]_{\varphi}$	'why?'

[?] constitutes the default realisation of the post-lexical NSC in all three dialects. The apparent free variation of [?] and [h] in utterance-final position in Hubaiʃi, and the realisation of [h] in this position in Gabiini and Kusmi, can be explained in terms of the NSC being the target of [+Ct] spread.

3.3. Features in the consonantal matrix:

I shall now consider the distinctive feature inventory for the consonantal systems of Hubaiʃi, Kusmi and Gabiini. Since the consonant inventories differ in only one aspect between the dialects - namely, in that Kusmi and Gabiini lack the phoneme /gh/ (lexemes with /gh/ in other dialects are pronounced with [^{C}] in the Raimi dialects), I shall treat them together in terms of feature specification.

3.3.1. Hubaiʃi has twenty seven consonant phonemes, while Gabiini and Kusmi have twenty six phonemes each. The consonant inventory for the three dialects is established informally below (/gh/ is placed in parenthesis, viz: (gh)):

	Lab	Dent	Alv	P-Alv	Pal	Vel	Uv	Phar	Gutt
Stop v	b		d		g			c	
-v			t			k	q		?
Fric v		dh					(gh)		
-v	f	th					x	H	h
Sib v			z						
-v			s	ʃ					
Voc v	w				j				
Nas v	m		n						
Liq lt			l						
vb			r						
Emp v		Dh							
-v			T						
-v sb			S						

Given the definition for distinctiveness as provided in the introduction: 'A feature 'F' is distinctive if and only if it serves to distinguish two sounds' (Archangeli 1984a:43), the following arguments are forwarded for identifying distinctive features in the consonantal system.

3.3.2. Firstly, the feature [consonantal] is distinctive for the voiced palatal stop /g/, for the liquids /r,l/, for the voiceless velar stop /k/, and for the labials /b,f/, but is assigned redundantly to all other [-Sn] consonants (after the complement value for [sonorant] has been assigned) and to nasals. This is expressed by the following default rules:

D.R. [ ] ---> [+Cns]/[___,+N]

D.R. [ ] ---> [+Cns]/[___,-Sn]

Of the laryngeal features, [voiced] is distinctive in the obstruent series, and serves to distinguish /d/ from /t/, /dh/ from /th/, /gh/ from /x/ (in Hubaiʃi only) and /z/ from /s/. It is assigned redundantly in the nasal, liquid and vocoid series (i.e. to the sonorants), viz:

D.R. [ ] ---> [+V]/[___,+Sn]

The nasals, /m,n/, and the vibrant, /r/, are [+sonorant], but redundantly so, since all nasals and the vibrant are [+sonorant], viz:

D.R. [ ] ---> [+Sn]/[___,+N/+Vb]

The palatal vocoid, /j/, and the liquid, /l/, are both distinctively [+sonorant]. [+Sonorant] is assigned by default rule to the [+round] vocoid, /w/, viz:

D.R. [ ] ---> [+Sn]/[___,+R]

Of the liquids, /l/ is the least marked[1]. and I assume here that [lateral] is not a feature in the consonantal system. [Vibrant] serves to distinguish the liquids /r/ and /l/. [Nasal] is distinctive and distinguishes /n/ from /l/, in particular, but also /n/ from /d/, and /m/ from /b/.

1. In the three dialects, virtually all children, and many adults pronounce lexical /r/ as [l], as in <u>baa[l]ak allaa fiik</u> 'may God bless you', and <u>?akba[l]</u> 'greater, bigger' for /?akbar/. /l/, on the other hand, is realised as [r] only in case /l/ forms the definite article and assimilation takes place from the initial /r/ of the defined noun, as in /l+rabb/ --> <u>(?a)[r]rabb</u> 'the lord'.

In terms of manner of articulation features, [continuant] is redundant in both the sonorant and the sibilant series, since sonorants and sibilants are universally [+continuant], viz:

D.R. [ ] ---> [+Ct]/[___,+Sn/+Sb]

[Continuant] does, however, serve to distinguish fricatives from non-fricatives at any single zone of constriction, i.e. /f/ from /b/ (marginally, though, since [voiced] is distinctive for /b/), /x/ from /q/, /H/ from /^{C}/ and /h/ from /?/.

[Sibilant] distinguishes the sibilants from other sounds produced in the same zone of constriction, viz; /s/ from /t/ and /z/ from /d/, and /S/ from /T/, and /ʃ/ from /g/ and /j/ (again, marginally, since [voiced] is distinctive for /g/ and derived for /j/).

There are five zones of constriction in this model: these are [labial], [coronal], [dorsal], [palatal] and [guttural]. Note that there is an asymmetry in these zones since [palatal] is dependent on [dorsal] and/or [coronal] while all other zones are primary. Note also that [dorsal] is not a terminal node in the present case.

[Labial] distinguishes the labial series, /m,b,f/, from all sounds which are produced at other zones of constriction. [+Labial] is assigned by default to /w/ which is distinctively [+round], viz:

D.R. [ ] ---> [+Lb]/[___,+R]

[Coronal] distinguishes the coronal sounds and the emphatics (pharyngealised coronals), /dh,th,d,t,s,z,ʃ,n,r,l,T,S,Dh/, from all non-coronal sounds.

[Palatal] is distinctive in the series of high consonants - /j/, /g/ and /ʃ/ are distinctively [+palatal] and redundantly [+high] - viz:

D.R. [ ] ---> [+H]/[__,+P]

In terms of [dorsal] features, /k/ is distinctively [+high] (and is assigned the value [-palatal] by complement rule (and cf. 2.3.3.1.1.)), viz:

C.R. [ ] ---> [-P]

As for the [+round] vowel, /u/ (cf. 2.5.3.), [+high] is assigned by default to the [+round] vocoid, /w/, viz:

D.R. [ ] ---> [+H]/[__,+R]

[Uvular] is distinctive for /q,x,gh/ and distinguishes /q/ from /?/ and /x/ from /h/. [Pharyngeal], as will be discussed below, is distinctive for the pharyngeal glides, /^{C},H/, and for the pharyngealised coronals, /S,T,Dh/.

Since [guttural] is assumed to be the default zone of constriction, [guttural] is present, but is totally <u>non-specified</u> in the consonantal matrix. Values for [guttural] are supplied redundantly - any segment which is [+high], [+labial] or [+coronal] is redundantly [-guttural]. Any segment which is [+uvular] or [+pharyngeal] (but not [+coronal]), or is non-specified for all specified zones of constriction, is [+guttural] by default.

3.3.3. Emphasis:

One of the major problems in the description of modern Arabic sound systems is the phenomenon of emphasis (Brame 1970, Broselow 1976): I posit [pharyngeal] to deal with the primary articulation of the voiced and voiceless pharyngeal glides, /^{C}/ and /H/, and the secondary articulation of pharyngealised consonants, /S,T,Dh/. In this system, presence of the feature [+pharyngeal] serves to distinguish 'emphatics' from non-emphatic coronals. In distinguishing 'emphatic' consonants, Broselow proposes use of the feature [constricted pharynx] adopted from Jakobson (1971), (and since taken up by McCarthy (1986:242) and Selkirk (1982:342) for Arabic) since:

> 'the characteristic feature of all the 'emphatic' phonemes is the contraction of the upper pharynx.' (Broselow 1976:xiv)

She posits the feature [C.P.] which is used in conjunction with [low]. I consider, on the one hand, that [constricted] is redundant, since the production of segments in any part of the vocal tract necessitates some constriction. Pharyngeal is posited as the zone of the vocal tract in which these segments are produced. A segment with the feature [+pharyngeal] in conjunction with a specified feature for some other constrictional zone (in these dialects, [+coronal]) is 'emphatic'. As far as the feature [low] is concerned, not only is it not a feature of the vocalic system in these dialects (its introduction in the consonantal system would thereby complicate the phonology, cf. 2.3.3.2.), but also, as Brame points out, the description in SPE of pharyngealisation as [+B,+L] cannot indicate emphatic articulation of segments conditioned by underlying emphasis in a syllable, since a high front vowel may also be produced with emphasis, viz:

t i i n 'figs' versus T <u>i</u> <u>i</u> n 'mud' (Brame 1970, cited in Broselow 1976)

The feature [pharyngeal] allows us to account for pharyngealisation of vowels where the phonetic value of pharyngealisation is to 'pull (Cs and) Vs to a central position' (Harris 1944:195) by stating that [+pharyngeal] spreads from a pharyngeal/pharyngealised consonant onto an adjacent vocalic target. No consonants are in need of [low] as a distinctive feature.

3.3.4. These distinctive features are represented on the consonantal matrix as below. Note that this matrix is correct for Hubaiʃi. The consonantal matrix for Kusmi and Gabiini differs in one respect only –

namely, both Raimi dialects lack the phoneme /gh/. Note that this matrix would obtain if the NSC for the consonantal system as a whole turns out to have a default realisation of [?]. As will be seen in chapter five, however, the default realisation of the lexical NSC differs from the default realisation of the post-lexical NSC. Problems concerning the treatment of lexical and post-lexical '?' - i.e. /?/ and the post-lexical NSC, and any necessary matrix changes will be dealt with in detail in chapter five.

Consonantal matrix

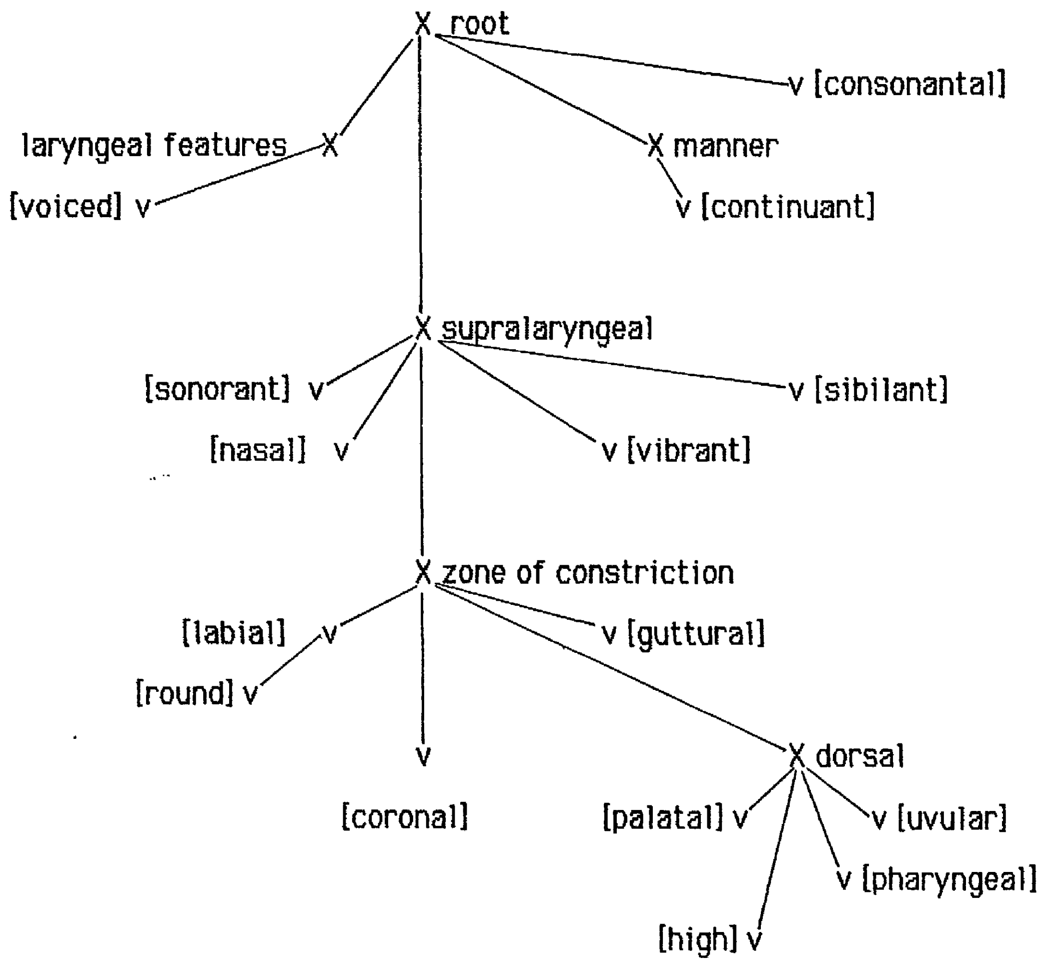
	b	m	f	dh	th	t	d	s	z	n	l	r	ʃ	g	k	gh	x	Dh	T	S	H	c	q	w	j	h	?
Cn	+		+								+	+		+	+												
V	+			+			+		+					+		+		+				+					
Sn											+														+		
Ct			+	+	+											+	+	+			+					+	
Sb								+	+				+							+							
N		+								+																	
Vb												+															
Rd																								+			
Lb	+	+	+																								
Cl				+	+	+	+	+	+	+	+	+	+					+	+	+							
P													+	+											+		
H															+												
U																+	+						+				
Ph																		+	+	+	+	+					
G																											
	b	m	f	dh	th	t	d	s	z	n	l	r	ʃ	g	k	gh	x	Dh	T	S	H	c	q	w	j	h	?

3.3.5. Redundancy rules operate in the following way in order to realise segments:

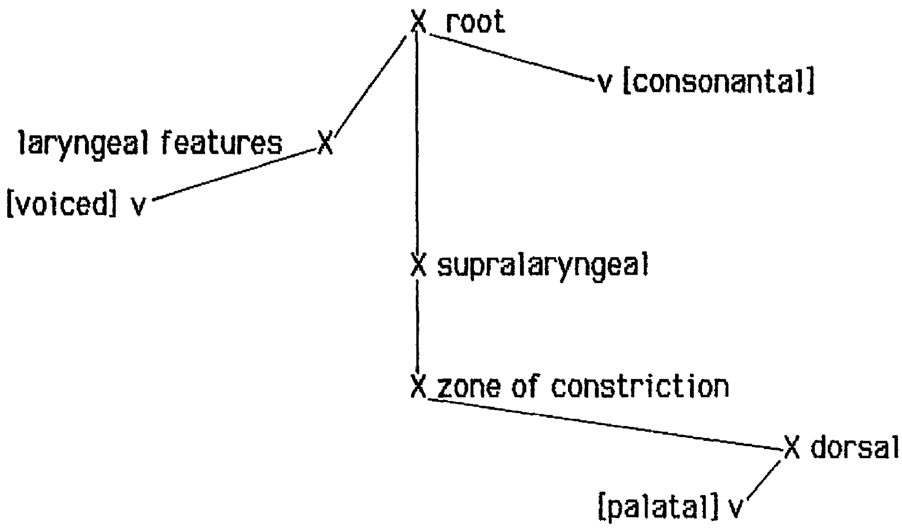
1.	[ ] ---> [+H] / [___,+P]	D.R.
2.	[ ] ---> [+H] / [___,+R]	D.R.
3.	[ ] ---> [+Sn] / [___,+R]	D.R.
4.	[ ] ---> [+Sn] / [___,+N]	D.R.
5.	[ ] ---> [+Sn] / [___,+Vb]	D.R.
6.	[ ] ---> [+Cns] / [___,+N]	D.R.
7.	[ ] ---> [-Sn]	C.R.
8.	[ ] ---> [+Cns] / [___,-Sn]	D.R.
9.	[ ] ---> [-Cns]	C.R.
10.	[ ] ---> [+V] / [___,+Sn]	D.R.
11.	[ ] ---> [+Ct] / [___,+Sn]	D.R.
12.	[ ] ---> [+Ct] / [___,+Sb]	D.R.
13.	[ ] ---> [-H]	C.R.
14.	[ ] ---> [-P]	C.R.
15.	[ ] ---> [-U]	C.R.
16.	[ ] ---> [-Vb]	C.R.
17a.	[ ] ---> [+Lb]/[___,+R]	D.R.
17.	[ ] ---> [-Lb]	C.R.
18.	[ ] ---> [-V]	C.R.
19.	[ ] ---> [-Ph]	C.R.
20.	[ ] ---> [-N]	C.R.
21.	[ ] ---> [-Ct]	C.R.
22.	[ ] ---> [-Sb]	C.R.
23.	[ ] ---> [-Cl]	C.R.
24.	[ ] ---> [-G] / [___,+H]	D.R.
25.	[ ] ---> [-G] / [___,+Lb]	D.R.
26.	[ ] ---> [-G] / [___,+Cl]	D.R.
27.	[ ] ---> [+G]	C.R.

3.4. The feature matrix tree:

These distinctive features are represented as terminal nodes on the feature matrix tree as below (where 'X' denotes class or non-terminal nodes and 'v' denotes terminal nodes):



3.4.1. Since the information for non-specified features is generally inessential to derive segments, phonemes are assigned partially specified trees underlyingly. The presence of one feature node implies the presence of all other feature nodes to which it is linked directly. Consider the underspecified feature matrix tree for /g/.



3.5. The relationship between the post-lexical NSSs:

A valuable generalisation is on the verge of slipping through the net. In chapter two, it was suggested that the syllabic and non-syllabic vocoids should be assigned identical feature specifications in order to capture phonological relationships such as that between a durationally long vowel within the utterance and a vocoid sequence in utterance-final position. Identity of feature specification is represented by placing the vowel to the top of the matrix, the non-syllabic vocoid to the foot. The vocoid matrix for the dialects (cf. 2.3.1.3.), repeated below for convenience (negative values removed), appears as below:

	i	u	a
H	+	+	
G			+
R		+	
P	+		
	j	w	?

(Note that there is an asymmetry here: [+R] is distinctive for both syllabic and non-syllabic round vocoids (/u/ and /w/), and [+G] is assigned by default to the NSV and the NSC; while the fully specified feature matrices for /j/ and /i/ are identical, however, [+H] is distinctive for the high syllabic vocoid /i/ and is derived for /j/, while [+P] is distinctive for the non-syllabic vocoid /j/ and is derived for /i/.)

At the beginning of this chapter and in chapter one, it was claimed that a rhyme-headed X slot may be projected if triggered by an unsyllabified non-rhyme-headed segment; a non-rhyme-headed X slot may be projected if triggered by an unsyllabified rhyme-headed segment. It is hypothesised that, for epenthesis, there is simply one NSS, which is realised either as [a] or as [?]. The difference in realisation is determined by the prosodic category of the unsyllabified element that triggers the appropriate rule bringing about syllabifiability. Elements which trigger syllabification for these dialects are both Cs and Vs. There is a complementarity here: if the unsyllabified element is rhyme-headed, i.e. $\overset{\downarrow}{X}_i$, then X is inserted, either to provide an onset, or to close a syllable. If the unsyllabified element is not rhyme-headed, i.e. X_i, then $\overset{\downarrow}{X}$ is inserted to provide a head. There is no need to speak of NSV and NSC at the post-lexical level since the syllabicity of the NSS is delegated to syllabification.

CHAPTER FOUR

The Verbal Systems

In examining the verbal systems in the dialects, I shall firstly consider arguments for representing the consonantal root on a separate morphemic tier to the vocalic melody by looking at instances of re-ordering of consonants within the word, word-play and morpheme structure constraints. I shall then consider the role of the vocalic melody of the perfective sound triliteral verb in the passive and the active voice. In contrast to other modern dialects of Arabic, it is observed that these dialects do have the mechanism for the internal passive. Having considered the derivation of the perfective triliteral verb in the active voice and in the passive voice, I shall continue to examine inflectional processes as they affect this verb type in the perfect aspect.

4.1. Distinct melodies:

In common with other varieties of Arabic - including Classical Arabic (Wright 1971) and Modern Standard Arabic (Cowan 1958 (1986), Ziadeh and Winder 1958, Haywood and Nahmad 1965, McCarthy 1981,1982,1985,1986) - the verbs in these Yemeni dialects pattern on the basis of a verbal stem plus (an) inflectional affix(es). The stem comprises a consonantal root which determines the semantics of the verb, in general, and a vocalic melody which often determines the voice (passive or active). In this thesis, as in the McCarthy model for nonconcatenative morphology (1981, 1982, 1985, 1986), the vocalic melody constitutes a morpheme separate from the consonantal root. McCarthy observes for Classical Arabic and the dialects that:

'Consonantal roots and vocalic melodies in Arabic, although they contain bundles of the same distinctive features, can nevertheless be represented on separate autosegmental tiers.' (McCarthy 1981:383)

4.1.1. The consonantal root:

In the McCarthy model for Classical Arabic (which is also applicable to the Yemeni dialects examined here), it is seen that words containing the triliteral root consonants k-t-b are semantically related even though they do not comprise strings of linearly isolatable morphemes, viz:

k a t a b	'he wrote'
k i t a a b	'book'
k u t u b	'books'
k a a t i b	'writer'
m a k t u u b	'letter (a thing written)'
m a k t a b	'office (writing place)'

It is also shown that many of the Classical Arabic binyanim (verbal derivational classes) have a particular derivational source - verbal or nominal and 'every property of the source except its root is ignored in the form of the derived binyan' (McCarthy 1981:379). This is also seen in these Yemeni dialects and exemplified in the following examples common to all three dialects:

verb	source
s a a f a r 'he traveled'	s a f a r 'travel (noun)'
(? a) t b a x x a r 'he got better'	b i + x a i r 'well'[1.]
m a r r a Dh 'he nursed'	m a r i i Dh 'ill/sick'
(? a) t q a h w a 'he drank coffee'	q a h w a 'coffee (husk)'

1. /bi+xair/ has been reanalysed in this instance as a single root, b-x-r (cf. Rossi 1939:46).

4.1.1.1. Re-ordering of root consonants:

A Hijazi Bedouin play on words wherein the root consonants (and only the root consonants) of a word are transposed respecting the canonical pattern and vocalism was cited in evidence of the root consonantism constituting a single unit at some level of representation (McCarthy 1981:379, 1982:196-8, 1986:211). The verbal form <u>difi^{c}naa</u> 'we pushed' was taken and the following permutations attested, viz:

	d i f i ^{c} n a a	'we pushed'
	f i d i ^{c} n a a	
	^{c} i d i f n a a	
	d i ^{c} i f n a a	
but not	* n i d i f ^{c} a a	

Since the /n/ of <u>naa</u> is in a different morpheme from the root consonantism /n/ cannot be freely permuted with the root consonants.

Similarly, Moroccan Arabic has a game in which the root is reversed, again respecting the canonical pattern and the vocalism of the input, eg.

<u>M.A.</u>	<u>disguised</u>	
k u b b	b u k k	'he poured'
g ə r r	r ə g g	'he confessed' (McCarthy 1986:228, from Heath 1984 p.c.)

In the Yemeni dialects examined here, several consonantal roots exist, the second and third radicals (at least) of which may be reordered with no or little loss in meaning: this includes the root q-r-ʃ 'to peel' which may be produced with second and third radicals transposed - <u>qaraʃ</u> or <u>qaʃar</u> 'he peels'. This suggests that the lexical entry for 'peel' is /q-r/ʃ/ wherein the ordering of the final two consonants is unspecified. Unless the discontinuous string of root consonants is treated as a unit in the grammar, the relationship between these different realisations is not apparent.

4.1.1.2. Word play:

There are many instances of word play in Arabic dialects. Word play may be realised as the permutation of root consonants on a certain morphological template as in the Hijazi Bedouin and Moroccan Arabic play on words cited above, or it may be realised as the association of root consonants with a different morphological template. An instance of the second case is play on the structure of names attested in and around the Hubaiʃ area. This word play, termed <u>muxaalif al-asaamii</u> 'the mixing up (or corrupting) of names', is known in a variety of forms throughout the country. In Hubaiʃi, pet names are created by associating the consonants of a name with a different morphological pattern. The following forms are offered:

```
f a a T i m i  --->    f u T a a m a
H a n a a n    --->    H a n u u n a
n a b i i l i  --->    n u b a a l a
j a s m i i n  --->    j u s a a m a
```

The basic consonantal root is associated with different morphological templates, viz:

```
            µ              vocalic melody
            |
          [+H]
            |
C V V C V C V              morphological template
      fTm
      \|/
       µ                   consonantal root
```

This yields [f a a T i m i] following association, tier conflation and the operation of redundancy rules.

μ vocalic melody
[+R]
C V C V V C V morphological template
fTm
μ consonantal root

This yields [f u T a a m a] following association, tier conflation and the operation of redundancy rules.

4.1.1.3. Morpheme structure constraints:

Since Arabic roots are subject to the Obligatory Contour Principle (0.4.1.1.2.2.) and all automatic spreading is rightward in Arabic (McCarthy 1986:209), there is an absence of nominal and verbal stems of the pattern $C_iVC_iVC_{ij}$, or, indeed, stems where the first and second consonants are homorganic (McCarthy 1986:208, Greenberg 1950). McCarthy and Greenberg do, however, note the existance of a unique Classical Arabic word: <u>dadan</u> 'plaything' (McCarthy 1986:209, 1981:396, Greenberg 1950:167). In Hubaiʃi, I was offered the following 'original Arabic' words used for children:

b a b a	'something sweet'
d a d a	'something beautiful'
w a w a	'something painful'

These words, however, do not constitute violations of the OCP since they are analysed as monoconsonantal, viz:

X X X X
b

I encountered no non-monoconsonantal melodies in which the first two consonants were identical or homorganic in any of the three Yemeni dialects examined here.

Not only do morpheme structure constraints affect the consonants in a word, they also affect the vocalic melody. McCarthy states that no Classical Arabic word has the vocalism 'i-u', nor does any verb begin with 'i'. In Hubaiʃi, Kusmi and Gabiini, no word has the vocalism 'i-u'; some verbs do, however, begin with 'i' owing to a general absence of the 'a-i' verb type in Yemeni - as in ʃimih 'he saw' and nizil 'he descended'. These various facts are difficult to explain unless the vocalic melody is represented on a separate tier to the consonantal root. The consonantal root is isolated as a separate morpheme using μ notation, viz:

```
  μ
  |
[root]
```

4.2. The verbal template: the first binyan:

Although several quadriliteral roots are attested, the consonantal root is predominantly biliteral or triliteral. The morphological template for the non-inflected sound bi- or triliteral verb in the perfect aspect in CA and MSA (which is the template for the triliteral verb in these dialects) - described by McCarthy for CA as the first binyan - appears as below:

```
  |   |
X X X X X
```

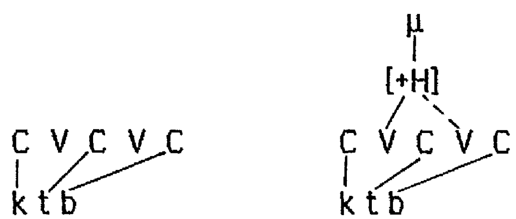
The first binyan is considered to be relatively unmarked morphologically; this is true both of CA and of the dialects under investigation.

4.2.1. The vocalic melody:

In contrast to many other modern dialects of Arabic[1.] the Yemeni dialects studied in this thesis do have a mechanism for the internal passive (cf. Rossi 1937:240,249, 1939:36, Goitein 1970:36).[2.]

Hubaiʃi:

In Hubaiʃi, the melodies for the perfect aspect of the (first binyan) verb may be seen implicationally as: if there is no specified vocalic melody for the verb in the active voice - i.e. the active perfect has only two components: a root consonantism and a morphological template - then any [+H] vocalic melody for the same verb (i.e. of the same consonantal root) denotes passive. Consider the associated representations for <u>katab</u> 'he wrote' and <u>kitib</u> 'it m. was written':



(passive)

Kusmi and Gabiini:

In the case of Kusmi and Gabiini, the picture differs slightly and the vocalic melody assumes more the character of melodic patterns for CA and MSA; the vocalic melody of the active voice is either [+H] or there is no specified vocalic melody. The vocalic melodies for the perfect aspect of the (first binyan) verb may be seen as: if there is no specified vocalic melody for the verb in the active voice, then the vocalic melody [+R] [+H]

1. van Ess (1938 (1976):119) mentions the non-occurrence of the internal passive in Iraqi dialects; Wise (1975:33ff.) notes passivisation by means of passive transformation in Educated Cairene Arabic.

2. Landberg notes for Dathiina dialect, that 'le passif est encore vivant dans les dialectes méridionale' (Landberg 1905-13:405).

denotes passive, as illustrated in the associated representations for qatal 'he killed' and qutil 'he was killed' below:

```
                          μ              (passive)
                         / \
                     [+R]  [+H]
                      |     |
C V C V C            C V C V C
|                    |
q t l                q t l
```

This can be stated formally as:

> 'Where the passive voice in the perfect aspect is indicated by the vocalic melody [+R][+H] for a given verb in the first binyan, a verb of the same binyan and consonantal root with no specified vocalic melody indicates active.'

The 'a-i' active vocalic melody of CA and MSA is apparent in none of these dialects, nor in many other modern dialects of Arabic (cf. Fischer and Jastrow 1980:107).

In some verbal forms such as ʃimih 'he saw', gizi^{c} 'he went' (Hub.) and simi^{c} 'he heard', the vocalic melody for the lexeme is determined lexically as [+H] in Hubaiʃi, Kusmi and Gabiini; for example:

```
      μ              vocalic melody
      |
    [+H]
C V C V C
ʃ m h
```

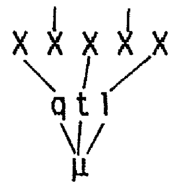
Following association, tier conflation and the operation of redundancy rules the realisation is as below:

ʃ i m i h   'he saw'

The morphological template provided denotes [perfect], and the vocalic melody for the particular lexical item denotes [active].

4.2.1.1. Hubaiʃi:

Consider the derivations of qatal 'he killed' and qitil 'he was killed' in Hubaiʃi:



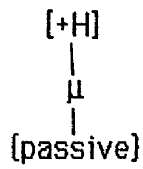
consonantal root

For this verb, no vocalic melody is assigned in the active voice of the perfect aspect. The NSV associates with the two rhyme-headed X slots which are realised by default as [a]. The form is realised as:

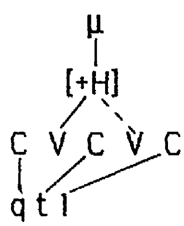
q a t a l 'he killed'

Any (specified) vocalic melody for this verb will denote [passive], as below:

Vocalic melody:



Elements from the vocalic melody associate with rhyme-headed X slots on the template, as below:



vocalic melody [passive]

Tier conflation and redundancy rules apply to provide the realisation:

q i t i l 'he was killed'

4.2.1.2. Kusmi and Gabiini:

In Kusmi and Gabiini, vowel distribution differs from Hubaiʃi in that while [active] either has no specified vocalic melody, or the vocalic melody is [+H], viz:

```
 [+H]
   |
   μ
   |
[active]
```

[passive] has the vocalic melody [+R][+H], accompanied by the stipulation that [+R] (the more highly-marked feature) is preassociated with the left-most rhyme-headed slot. Preassociation of [+R] prevents the spread of [+R] onto the adjacent [+H] vowel:

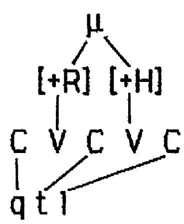
```
[+R] [+H]
   \  /
    μ
    |
[passive]
```

4.2.1.2.1. Association of [+R]:

```
           |
verb [ X   X
           |
         [+R]
```

As in CA (cf. McCarthy 1985:230), no non-loan word in these dialects has the vocalism 'i-u'.

If the [passive] representation is applied to the morphological template of the first binyan where root consonants of the verb are q-t-l, the following associated output results:



(passive)

Following the application of tier conflation and redundancy rules, the form is realised as:

q u t i l 'he was killed'

4.3. Inflectional processes in the sound triliteral verb:

I shall now examine inflectional processes in the perfect aspect of the sound triliteral verb. Inflection in the perfect aspect takes the form of suffixation; inflection in the imperfect aspect takes the form of prefixation only, in the case of singular inflections, and prefixation and suffixation in the case of plural inflections. With each inflectional prefix or suffix a morphemic tier is added to the verbal stem. While full paradigms of the verb <u>xabaz</u> 'to bake' will be supplied for each dialect, discussion is restricted to the inflectional tiers introduced on the morphological template. In this (unmarked) verb type, the form for [third masculine singular] is taken to be identical to the verbal stem - that is to say, the subject pronoun for the [third masculine singular] inflection in the perfect aspect is nul. The morphological template for the verbal stem of this verb type is therefore posited as below:

$x\ \overset{\downarrow}{x}\ x\ \overset{\downarrow}{x}\ x$ (and cf. 4.2.)

Since the argument is to revolve around the [perfect] aspect of the verb, discussion is restricted here to paradigms of the verb in the [perfect] aspect. Any discrepancy in terms of vowel distribution in the stem of certain inflectional forms will be dealt with in chapter eight. For convenience, the gloss will be provided in the past tense, since [perfect] is more frequently connected to [past] than to [present]; however, it must be appreciated that the correlation [perfect]/[past] is far from absolute. It may not be concluded that the forms below in the [perfect] aspect necessarily denote [past]. The structural paradigm will be supplied for Hubaiʃi before consideration of Kusmi and Gabiini. In all instances, inflections are provided in their word-final state, i.e. with the alternant that occurs when phonologically word final. Inflection in weak verbs - i.e. the 'hollow' verb and biliteral verb types - will be dealt with in chapter seven.

4.3.1. Labelling of inflectional morphemic tiers:

Morphemic tiers are labelled according to morphological features. Note that, as with phonological distinctive features, the only feature/s marked are those which serve to distinguish one morpheme from a second. Since morphological entities (like phonological entities) are distinguished by the presence of a feature as opposed to the absence of a feature, only [F] is marked for each morphological feature [F] within a category - that is to say, morphological features are monovalent. In a rule, absence of the marking [F] implies that [F] is quite absent or that it is not distinctive for that morpheme. Therefore, the morpheme is either assumed to have the unmarked feature for the category, or specification of [F] is quite immaterial. Inflectional features are:

Category:	marked feature	unmarked feature
Gender:	[feminine] ([fem]/[f])	[masculine] is unmarked
Number:	[plural] ([Pl])	[singular] is unmarked
Person:	[first] ([1])	[third] is unmarked
	[second] ([2])	

The non-specified inflectional form is, therefore, that which is generally accepted to be the unmarked inflection in Semitic languages, [third masculine singular], such that the default rules read:

Gender: [ ] ---> [masculine]

Number: [ ] ---> [singular]

Person: [ ] ---> [third]

This is reflected in this inflection lacking any overt marker in the perfect aspect of the verb. The most highly marked inflection, on the other hand, is [second feminine plural].[1]

4.3.2. Hubaiʃi:

Consider, in the first instance, the Hubaiʃi data below:

		pl.
1.	x a b u z - k	x a b a z - n a a
2.m.	x a b a z - k	x a b a z - k u m
2.f.	x a b a z - k i	x a b a z - k a n
3.f.	x a b a z - a	x a b a z - e i n
3.m.	x a b a z	x a b a z - u u/m[2]

4.3.3. Raimi:

As the Kusmi and Gablini paradigms are considered in relation to that of Hubaiʃi, it is observed that the dialects differ in one of four ways insofar

1. This inflection has disappeared in many modern dialects of Arabic - including dialects spoken in the Yemeni Tihaama (Behnstedt 1985, Greenman 1979:58-60), and also in some Ethiopian Semitic languages - eg. Amharic (Hayward p.c.).

2. [m] is always articulated to the left of a vowel-initial object pronoun. To the left of a negative suffix, [m] is never pronounced. In phonological word-final position, whether or not the verb appears in utterance-final position, [um] or [uu] appear to be freely variable.

as the perfect aspect of the triliteral verb is concerned:

a) Distinct suffixal templates are posited for certain inflections in the two dialects. These inflections include: {second fem.} and {third fem.}. The case of {third fem.} is handled in detail below (cf. chapter six).

b) In the case of the {second fem. pl.} subject pronoun, while morphological templates are identical for the three dialects (CVC {second fem. pl.}), vocalic features differ; the vowel is underlyingly non-specified in the case of Hubaiʃi and is marked [+R] in the case of Kusmi and Gabiini.

c) In the case of the {first singular} subject pronoun, one of the phonological features associated with the morpheme differs: [+R] is present in Kusmi and Hubaiʃi and is not present in the Gabiini dialect. (This is handled in detail in chapter eight.)

d) And, finally, a monophthongal pronunciation of the long vowel in {third fem. pl.} is noted in the Raimi dialects; a diphthongal pronunciation is noted in Hubaiʃi. Since mid-qualities are restricted to long vowels in Kusmi and Gabiini, which in Hubaiʃi and other dialects of the area are pronounced as diphthongs, it is assumed that a process of monophthongisation applies at a late stage in the derivation in the Raimi dialects. (This is mentioned in chapter two, cf. 2.2., and detailed in chapter seven, cf. 7.2.2.1.1..)

4.3.3.1. Kusmi:

		pl.
1.	x a b a z - [k^w]	x a b a z - n a a
2.m.	x a b a z - k	x a b a z - k u m
2.f.	x a b a z - [tʃ]/[k_j]	x a b a z - k u n
3.f.	x a b a z - a t	x a b a z - e e n
3.m.	x a b a z	x a b a z - u m [1]

1. [m] materialises in all positions except to the left of a consonant-initial object pronoun when this inflection is pronounced as [uu].

4.3.3.2. Gabiini:

A comparison of the Gabiini data with that of Kusmi, (4.3.3.1.), reveals that the geographical proximity enjoyed by these two dialects is reflected in far greater identity of form. Variation is manifested to no degree in template structure, rather it is manifested in vocalic feature specification, in the case of the (first singular) subject pronoun ([+R] in Kusmi as opposed to the absence of [R] in Gabiini), in realisation of the (second fem. singular) subject pronoun - [tʃ] or [k_j] in the case of Kusmi, and [ʃ] in the case of Gabiini (cf. 2.1.1.1.1.2. and 2.1.1.1.1.3.) - and in the absence of [m] in the Gabiini (masc. pl.) subject pronoun.

		pl.
1.	x a b a z - k	x a b a z - n a a
2.m.	x a b a z - k	x a b a z - k u m
2.f.	x a b a z - ʃ	x a b a z - k u n
3.f.	x a b a z - a t	x a b a z - e e n
3.m.	x a b a z	x a b a z - u u

CHAPTER FIVE

Non-specification at the Lexical Level

The command 'insert X' noted in chapter three, where the NSS associates with 'X' and is realised by default as [a] or [?] captures a symmetry between the syllabic and the non-syllabic gutturals. However, while both syllabic and non-syllabic gutturals enter into epenthetic processes, and both are deletable when syllabification does not require their realisation, and both are weak, as noted in chapter three, in these statements discussion has been restricted to the post-lexical component. Prior to the post-lexical component, the symmetry between 'a' and '?' is more tenuous than it first appeared.

In this chapter, I shall begin by examining the morphological function of /a/. The priviliges of occurrence enjoyed by /a/ in the lexical component lead me to claim that 'a' is the NSV in the lexical as well as in the post-lexical component. I shall then continue to consider the lexical occurrences and any morphological functions of the phonemes /h/ and /?/ to establish that, far from being non-specified or minimally-specified at this level, the laryngeals are highly marked. Since lexical frequency of occurrence and morphological function are characteristics of the NSS in the lexical component, it is not possible to consider that /?/ is non-specified at the lexical level. In the light of this observation, I shall look at consonants which enjoy morphological function. It is observed that /t/ has a far higher privilige of occurrence than other consonants. The lexical rarity of the glottal stop together with the frequency of occurrence and the varied morphological functions of /t/ lead me to propose that there are two NSCs - one at the post-lexical level with a default realisation of [?], and one at the lexical level with a default realisation of [t].

5.1. /a/ as the lexical NSV:

[a] occurs frequently, not only post-lexically, where its function is epenthetic, but also lexically, where its function is morphological. In the perfect aspect of first binyan verbal forms in Hubaiʃi, the presence of [a] indicates {active}, which may contrast with a first binyan verb of the same root with the vowel [i] indicating {passive}. Similarly, the presence of [a] frequently denotes {transitive}, and may contrast with a verb of the same root with the vowel [i] indicating {intransitive}, viz:

q [a] t [a] l	'he killed'
q [i] t [i] l	'he was killed' (pass)
m [a] r [a] Dh	'he made ill' (trns)
m [i] r [i] Dh	'he became ill' (intr)

While some causative verbs follow the second binyan causative pattern of gemination of the second root radical, in several verbs it is also the presence of [a] as opposed to the presence of [i] which indicates causitivity in the perfect aspect. This is the case in the following example attested in all three dialects:

t [a] ^{C} ^{C} [a] b	'he tired' (caus)
t [i] ^{C} [i] b	'he became tired'

In Kusmi and Gabiini, the presence of [a] in the perfect stem denotes {active} or {transitive}; the presence of [i] frequently denotes {intransitive} (or {active}); and the presence of [u] [i] denotes {passive} (cf. 4.2.1.2.).

q [a] t [a] l	'he killed'
q [u] t [i] l	'he was killed' (pass)

t [i] ^{c} [i] b 'he tired' (intr)

5.1.1. Participles:

5.1.1.1. [passive]:

In participles formed from derived verbs, the right-most stem vowel is realised as either [i] or [a]. In this case, the presence of [a] denotes [passive], while [i] denotes [active], viz:

```
                   µ                 [active]
                   |
 [+R]            [+H]
   |               |
C  V  C  V  C  C   V  C   --->     m u c a l l [i] m 'teacher'
|     |     |/        |
m     c     l         m

                   µ                 [passive]
                   |
 [+R]              |
   |               |
C  V  C  V  C  C   V  C   --->     m u c a l l [a] m 'taught'
|     |     |/        |
m     c     l         m
```

From the examples given above, it is seen that the prefixation of [mu] to a derived imperfect verbal stem denotes [active participle], while the prefixation of [mu] to a derived perfect verbal stem denotes [passive participle]. In the formation of the passive participle of the first binyan, however, the vowel to the right of [m] is invariably realised as [a], as in:

m [a] k t u u b 'written (letter)' source: k a t a b

m [a] s m u u H 'permitted' source: s a m a H

5.1.1.2. Nouns of place and instrument:

In the noun of place, initial [ma] is associated with the morphological templates: X X X X X X, or X X X X X X X as in:

m [a] d f a n	'store'
m [a] k t a b	'office'
m [a] f r a g	'top room of the house used for social gatherings and chewing 'qat''
m [a] d r a s a	'school'

In the noun of instrument[1] in these dialects, initial [ma] is likewise associated with the morphological templates: X X X X X X or X X X X X X X as in:

m [a] l k a d	'pestel and mortar' (Hub.)
m [a] n x a l	'seive'
m [a] ^{c} w a l	'axe'
m [a] f a k k	'tin-opener'
m [a] s h a q a	'stone for crushing garlic'
m [a] x b a z a	'straw-stuffed pad for applying bread to the side of the oven'

5.1.2. The inflectional role of /a/:

/a/ also plays a role in inflection in the dialects. The realisation of [a] to the right of a perfect verbal or nominal stem with /a/ vowels, in the case of Hubaiʃi, and in the case of the Raimi dialects, [at] to the right of a perfect verbal stem, and [a] to the right of a nominal stem denotes [feminine singular], for example:

k a t a b [a]   'she wrote' (Hub.)

1. In the morphological template: X X X X X X X it is [i], however, and not [a] which is realised to the right of [m] in the noun of instrument, as in:

m [i] l q a a T   'tongs for carrying coals for the water pipe'

m [i] f t a a H   'key'

k a t a b [a] t	'she wrote' (Kus./Gab.)
m u d a r r i s [a]	'a teacher f.' (Kus./Gab.)
m a d r a s [a]	'a school'

[aat] to the right of a noun unmarked for number and gender denotes (feminine plural) is the general case in all three dialects:

m u d a r r i s [a a] t	'teachers f.'
m u x a z z i n [a a] t	'qāt-chewers f.'

[naa] to the right of the perfect verbal stem denotes (first plural):

r a S a d n [a a]	'we wrote'
s a w w a q n [a a]	'we went to market'

5.2. Vocalic melodies:

Consideration of the set of vocalic melodies and their priviliges of occurrence given below shows that /a/ enjoys wider morphological function than either /u/ or /i/ in all three dialects examined:

	Verbal infl.	nom. infl.	verbal mel.	participles
a	1 (Pl) {fem} fem 2 Pl (Hub.)	fem ((Pl))	{tr} {act}	{pass} {N.P./I.}
u	Pl (imp) fem Pl 2 (K/G)		{pass} (K/G)	{part}
i	fem 2 imp (Hub.)	{Pl}	{intr} {pass} (Hub.)	{act}

The features used in the above table are abbreviated for convenience as below:

Category	marked	unmarked
Aspect	{imp} - imperfect,	{perfect};
Voice	{pass} - passive	{active};
Gender	{fem} - feminine	{masculine};
Person	{1} - first	{third};
	{2} - second	
Number	{Pl} - plural	{singular}; (and cf. 4.3.1.)

In addition, {part} denotes the initial portion of both active and passive participles and {N.P./I.} denotes noun of place and noun of instrument; {act} denotes the active voice in participles, and (pass) denotes the passive voice in participles; (tr) denotes transitive and (intr) denotes intransitive. Where the particular function of the vowel is restricted to one or two dialects, (Hub.) denotes Hubaiʃi, (K) denotes Kusmi and (G) denotes Gabiini.

5.3. Lexical laryngeals:

Just as is the case with the minimal vowel, not every occurrence of the minimal consonant is predictable (cf. 3.1.2.2. and 3.1.2.3.). However, in contrast to the lexical frequency of /a/, unpredictable occurrences of both /ʔ/ and /h/ are rare. In the post-lexical phonology, laryngeals occur with great frequency (cf. chapter three): not only does [ʔ] associate with prothesised onset slots and both [h] and [ʔ] associate with final epenthesised rhyme slots, but also, in utterance-final position, consonants are frequently subject to glottal infection in all three dialects (cf. A.2.). In the lexical phonology laryngeals are evident, yet, in comparison to other consonants, they are rarely attested. Frequently, when underlyingly represented, laryngeals are subject to laryngeal disassociation (cf. 1.6. and 3.1.2.).

Consider instances where /ʔ/ and /h/ constitute one of the root consonants in a word.

5.3.1. Pronouns and demonstratives:

In pronouns and demonstratives, one or other of the laryngeals constitutes the initial segment of the lexical template. In Hubaiʃi, the following forms are attested:

5.3.1.1. Hubaiʃi:

An initial glottal stop occurs in the following pronouns:

[?] a n a	'I'	[?] a H n a	'we'
[?] a n t a	'you m.s.'	[?] a n t u m	'you m.pl.'
[?] i n t i	'you f.s.'	[?] a n t e i n	'you f.pl.'

An initial laryngeal fricative occurs in the remaining pronouns and in the demonstratives:

[h] u	'he'	[h] u m	'they/them m.'
[h] i	'she'	[h] a n	'they/them f.'
[h] a a dh a a	'this m.'	[h] a a dh i i	'this f.'
[h] a a dh u m	'these m./f.'		
[h] a a dh a a k	'that m.'	[h] a a dh i i k	'that f.'
[h] a a dh u u k	'those m.'	[h] a a dh e i k	'those f.'

And in Hubaiʃi, the following demonstratives and locatives are also attested with an initial laryngeal fricative:

[h] a a dh a k a a	'that m.'	[h] a a dh i k i i	'that f.'
[h] a a dh u k u u	'those m.' [1]		
[h] u u n a	'here'	[h] u n a a k a	'there'
[h] a a k a	'like that'		

5.3.1.2. Raimi:

In Kusmi and Gabiini, the following pronominal forms are attested:

An initial glottal stop in the (first) and (second) independent pronouns:

[?] a n a	'I'	[?] a H n a	'we'

1. In context the middle vowel of these forms may be elided by syncope. These forms are used only where the subject has been mentioned previously - very commonly in story telling. Jastrow, who notes the same phenomenon for Gibla, suggests these demonstratives signify 'mittlere Deixis' - 'dieser dort od. dieser jener' (Fischer und Jastrow 1980:116).

[?] a n t a	'you m.s.'	[?] a n t u m	'you m.pl.'
[?] a n t i	'you f.s.'	[?] a n t u n	'you f.pl.'

An initial laryngeal fricative in the (third) person pronouns:

[h] u	'he'	[h] u m	'they/them m.'
[h] i	'she'	[h] a n	'they/them f.'

In the demonstratives and the locatives an initial laryngeal fricative is attested for all forms in both dialects:

Kusmi:

[h] a a dh a a	'this m.'	[h] a a dh i i	'this f.'
[h] a a dh e e n	'these m./f.'		
[h] a a dh a a k	'that m.'	[h] a a dh i i [k_j]/[tʃ]	'that f.'
[h] a a dh a k a n	'those m.'		
[h] a a n a	'here'	[h] a a n a k a	'there'
[h] a a k a dh a	'like that'		

Gabiini:

[h] a a Dh a a	'this m.'	[h] a a Dh i i	'this f.'
[h] a a Dh e e n	'these m./f.'		
[h] a a Dh a a k	'that m.'	[h] a a Dh i i k	'that f.'
[h] a a Dh a k a n	'those m.'		
[h] a a n a	'here'	[h] a a n a k a	'there'

(however, k a Dh a a k 'like that')

5.3.2. /h/ and /?/ in non-demonstrative lexemes:

In all three dialects, a very few non-demonstrative lexemes exist of which

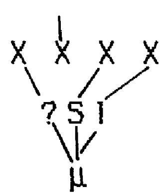
/h/ constitutes C_i of the consonantal melody; these include:

[h] u b l a	'stupid f.s.'
[h] i l a a l	'moon crescent'
[h] u m u u m	'worries, cares'

Outside the pronouns, /?/ constitutes C_i in still fewer instances. In all three dialects, these include:

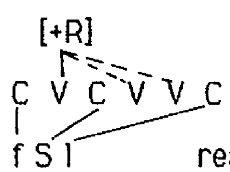
[?] a S l	'root'
[?] a m s	'yesterday'
[?] a s a a s	'basis'

While initial [?] per se could always be accounted for as the NSC associating with an obligatory onset slot, it is clear that in the nouns above '?' does constitute the initial element of the consonantal root melody. This is seen in the fact that the nouns given above exhibit strong similarities to triliteral nouns which share the same morphological template. In the same way as faSl 'class, division', fard 'individual', the consonantal melody of [?]aSl, for example, associates with the nominal template of the shape:



consonantal root

In addition, the broken plurals of [?]aSl 'root' and faSl 'division' share identical morphological templates, viz.



realised as f u S u u l 'divisions, classes' and:

```
      [+R]
C V C V V C
? S l          realised as  ? u S u u l  'roots'
```

As C_{ii} of the lexical root, /h/ is attested in a few lexical items in all three dialects, as in:

g a a [h] i l	pl. g u [h] a a l	'child'
ʃ a [h] r	pl. ʃ u [h] u u r/? a ʃ [h] a r	'month'

And /?/, while evident in C_{ii} position in all three dialects, is decidedly rare, as in:

r a [?] s	'head'
dh i [?] b	'wolf'
b i [?] r	'well'
b u [?] s	'courage' [1]

In C_{iii} position, the glottal stop is attested in Hubaiʃi as in the hollow verb <u>gaa?</u> 'he came' and in overtly inflected forms of this verb:

g u [?] k	'I came'
g a a [?] a	'she came'

In Kusmi and Gabiini, the glottal stop is attested as C_{iii} word-finally, as in the (third masculine singular) form of the hollow verb, <u>ʃaa?</u> 'he wants' (perfect aspect), but is realised in no overtly inflected forms thereof:

	ʃ a a [?]	'he wants'
but	ʃ u u k	'I want' (Kus.)
	ʃ i i k	'I want' (Gab.)

1. In these lexemes, the sequence 'vowel-[?]' has an alternative long vowel realisation in the Raimi dialects (cf. 3.1.2.3.).

ʃiinaa 'we want'

It will be appreciated that the role of the glottal stop in dhi[?]b 'wolf' and gu[?]k 'I came' is essentially distinct from the role of [?] as realisation of the post-lexical NSC in la[?]]φ 'no' in utterance-final position. In Educated Cairene Arabic, Broselow recognises two major classes of initial /?/:

> 'those which are always present no matter what the environment, and those which often drop.' (Broselow 1976:24)

Given the paucity in lexical occurrence of the laryngeal consonants as opposed to the monopolizing post-lexical frequency of [?] and [h], and seeing this in relation to both the lexical and the post-lexical frequency of 'a', it is highly desirable to capture the distinction between, in particular, /?/ and [?]. Broselow's observation is unexplained by her; the present approach goes beyond explanation of the glottal stop in Yemeni dialects and also offers an explanation of the glottal stop in other modern dialects of Arabic and in CA.

5.4. The lexical and the post-lexical glottal stop:

While there was general consensus that the pronunciation of the lexical glottal stop was identical to that of the post-lexical glottal stop (Phillipi 1895:189), the Arab grammarians recognised the functional difference between the glottal stop as a phoneme and the glottal stop as a segment realised in response to syllable requirements. Traditionally, the phonemic glottal stop is termed 'hamzat al-qaT^{C}' or '?alif al-qaT^{C}', while the prosodic glottal stop is termed 'hamzat al-waSl' or '?alif al-waSl' – where 'waSl' is taken to mean 'connection'. Ziadeh and Winder write:

> 'In some cases, the initial hamzah is not an essential part of the word. In these cases, when the initial hamzah is preceded

by another word, the hamzah and its vowel are dropped.' (Ziadeh and Winder 1958:18)

Arab grammarians differentiate between the two glottal stops (or hamzas) orthographically by writing the 'connecting' hamza as an alif (long 'a') with the vowel and without the sign for hamza (ء). Wright notes:

'In many cases where an élif conjunctionis at the beginning of the word receives its own vowel, the grammarians omit the hémza and write merely the vowel: eg.
praise belongs to God　　　اَلحمد للّه
(Wright 1971:16)

It is hamzat al-waSl which is said to be invariably subject to elision. Wright continues to say:

'When the vowels with hémza at the commencement of a word are absorbed by the final vowel of the preceding word, the elision of the spiritus lenis is marked by the sign -ٱ written over the élif and called وَصْل i.e. union .' (Wright1971:19)

And so, in Classical Arabic, the glottal stop is traditionally said to be elided in context in the case of:

a) the [?]al of the definite article;

b) the initial glottal stop in imperatives of the underived triliteral verb;

c) the initial glottal stop of the perfect active, the imperative and the verbal noun of the seventh and all following forms of the verb, and the initial glottal stop of the perfect passive of the same forms;

d) the initial glottal stop of eight common nouns, viz:
إبنة، إبن، إثنان، إثنتان، إسم، إست، إمرأة، إمرؤ . (Wright 1971:20)

In this model, I wish to formalise the distinction between the lexical and the post-lexical glottal stop so long recognised by the Arab grammarians. I shall suggest that the lexical glottal stop (hamzat al-qaT^{C}) is distinguished from the post-lexical glottal stop (hamzat al-waSl) by having specifications at the point where relevant rules apply. It must be pointed out that the Arab grammarians' analysis of hamzat al-waSl did not go beyond the case of initial [?]. In my analysis of the post-lexical glottal stop (or NSC), I am recognising a wider class of phenomena.

5.5. 'Letters of increase':

Not only do /?/ and /h/ manifest themselves rarely as part of the consonantal root, but also /h/ enjoys no morphological function as what is traditionally known as a 'letter of increase', either inflectionally, or at the derivational level, and /?/ enjoys relatively little morphological function.

5.5.1. Derivational:

I shall consider the derivational level in the first instance. Certain consonants are associated with slots which have been inserted, not only in response to the Well-formedness Condition for syllabification (1.5.1.), but also by the morphology in order to create lexemes. In the following examples, it is assumed that these forms are attested in all three dialects unless otherwise stated:

[m] (initial) in the formation of participles and nouns of place and instrument:

<u>noun of place:</u>

[m] a d r a s a	'school'	from	d r s
[m] a f r a g	'social room'	from	f r g
[m] a d f a n	'store'	from	d f n

noun of instrument:

[m] i l q a a T	'tongs'	from	l q T
[m] a n x a l	'seive'	from	n x l
[m] a ^{C} w a l	'axe'	from	^{C} w l

active participle:

[m] u ^{C} a l l i m	'teacher m.'	from	^{C} l m
[m] u q a w w i t	'qāt-dealer m.'	from	q w t

passive participle:

[m] a q t u u l	'killed m.'	from	q t l
[m] a s g u u n	'imprisoned m.'	from	s g n

[?] (initial)

elative:

[?] a t H a f	'better'	from	t H f (Hub.)
[?] a ʃ k a l	'better'	from	ʃ k l
[?] a g m a l	'more beautiful'	from	g m l

formation of

form IV verb type:

[?] a b S a r	'he saw'	from	b S r (Hub.)
[?] a ^{C} g a b	'he pleased'	from	^{C} g b

[t] (initial):

formation of denominal verbs:

(? i) [t] n i ^{C} n i ^{C}	'he chewed mints'	from	n i ^{C} n i ^{C}
(? a) [t] ʃ a j j i k	'he was chic'	from	ʃ i i k chic - loan
(? a) [t] q a h w a	'he drank coffee'	from	q a h w a

formation of

verbs of reciprocity:

(? a) [t] ^{C} a a w a n	'he cooperated with'	from	^{C} w n

(? a) [t] x a a b a r	'he chatted with'	from	x b r

formation of refl.

verbs:

(? a) [t] k a r b a s	'he sat down'	from	k r b s
(? a) [t] b a x x a r	'he recovered'	from	b x r
[t] a T a w w a r	'he/it developed'	from	Tw r

[t] (medial)

Frequently, [t] may be infixed into the morphological template of a basic verb form giving little difference to the meaning, or giving an intransitive, a passive or a reflexive meaning (cf. McCarthy 1985:252,254 for CA, Behnstedt 1987:34 for Yemeni dialects of the Sa^{c}da region):

(? a) ʃ [t] a r i	'he bought'	from	ʃ r j (Hub.)
(? a) ʃ [t] a gh a l	'he worked'	from	ʃ gh l (Hub.)
(? a) ʃ [t] a r a	'he bought'	from	ʃ r j (K/G)
(? a) ʃ [t] a ^{c} a l	'he worked'	from	ʃ gh l (K/G)
(? a) s [t] a w i	'it was cooked'	from	s w j (Hub.)
(? a) H [t] a b a s	'he was imprisoned'	from	H b s
(? a) f [t] a g a ?	'he was frightened'	from	f g ?

[s] (initial)

estimation

In conjunction with [t], [s] is often preposed to afford a sense of estimating the notion contained in the unaugmented form of the verb:

(? a) [s t] a n k a r 'he despised/considered ignorant' from n k r

5.5.2. Inflectional:

Certain consonants also have an inflectional function, as below.

[m] (final)

In Kusmi, [m] in conjunction with the preceding round vowel, denotes {masculine plural} in the verb (but it is not realised to the left of a consonant-initial object pronoun.) In Hubaiʃi, [m] is obligatory in {masculine plural} to the left of a vowel-initial object pronoun (unless the final root consonant is roundable, cf. 1.7.2.2.1.), but is never realised to the left of a consonant-initial object pronoun and is optional in phonological word-final position.

<u>verbal plural:</u>

x a b a z u [m]	'they m. baked'	(Kus., optional Hub.)
j i ʃ m a h u [m]	'they m. see'	(Kus., optional Hub.)
j i ʃ m a h u [m] u (h)	'they m. see him'	(Kus./Hub.)
t i ʃ m a h u [m]	'you m.pl. see'	(Kus., optional Hub.)

[n] (final)

In all three dialects, [n], in conjunction with the preceding long vowel, denotes {masculine plural} in nouns which adopt the sound plural pattern.

<u>nominal plural:</u>

m u x a z z i n i i [n]	'qāt-chewers m.'
? a w w a l i i [n]	'first m.pl.'
m u s a w w i q i i [n]	'market-goers m.'

In all three dialects, [n] denotes {feminine plural} and {first plural} in the perfect aspect, and {first plural} in the imperfect aspect.

<u>verbal plural</u>

<u>2 fem.pl.</u>

k a t a b k u [n]	'you f.pl. wrote' (Kus./Gab.)
x a b a z k a [n]	'you f.pl. baked' (Hub.)

<u>fem.pl.</u>

x a b a z e e [n]	'they f. baked' (Kus./Gab.)

x a b a z e i [n]	'they f. baked' (Hub.)

<u>1 plural</u>

x a b a z [n] a a	'we baked'

<u>imp. 1 plural</u>

[n] u x b u z	'we bake'

[?] (initial)

In all three dialects, [?] indicates (first singular) in the imperfect aspect of the verb.

<u>1 imperfect</u>

[?] a g i s s	'I sit'
[?] a x a z z i n	'I chew (qāt)'
[?] a g z a ^{c}	'I go' (Hub./Kus.)

[t] (initial)

Initial [t] indicates (third feminine singular) and (second) in the imperfect aspect of the verb in all three dialects.

<u>3 fem. imperfect</u>

[t] i s a w w i i	'she prepares (food)'
[t] i t ^{c} a b	'she tires'

<u>2 imperfect</u>

[t] i ʃ m a h	'you m.s. see'
[t] i g i s s	'you m.s. sit'

<u>2 pl. imperfect</u>

[t] i ʃ m a h u u	'you m.pl. see' (Gab.)

<u>2 fem. pl. imperfect</u>

[t] i ʃ m a h e i n	'you f.pl. see' (Hub.)
[t] i ʃ m a h e e n	'you f.pl. see' (Kus./Gab.)

[t] (final)

[aat] denotes {feminine plural} when affixed to a noun.

nominal plural feminine

q a a b i l a a [t]	'midwives (local)'
g i d d a a [t]	'midwives (traditional)'

[j] (initial)

Initial [j] indicates {third} in the imperfect aspect, but does not indicate {third feminine singular}, as noted above.

verbal imperfect

[j] i g i s s	'he sits'
[j] u r S u d	'he writes' (Hub.)

plural

[j] u k t u b u m	'they m. write' (Kus.)
[j] u k t u b u u	'they m. write' (Gab.)

feminine plural

[j] i ʃ m a h e i n	'they f. see' (Hub.)
[j] i ʃ m a h e e n	'they f. see' (Kus.)

[k] (final)

[k] to the left of the perfect stem denotes {first singular} and {second} in the perfect aspect of the verb.

verbal

1

k a t u b [k]	'I wrote' (Hub.)
k a t a b [k]	'I wrote' (Gab.)

2

x a b a z [k]	'you m.s. baked'

2 plural

x a b a z [k] u m	'you m.pl. baked'

2 fem. plural

x a b a z [k] u n 'you f.pl. baked' (Kus./Gab.)

x a b a z [k] a n 'you f.pl. baked' (Hub.)

Of the 'letters of increase' mentioned above, it is [t] which is most frequently realised and which enjoys most priviliges of occurrence. [t], as seen below, not only has derivational and inflectional functions, but also has the function of indicating feminine possessive or genitive in Hubaiʃi:

feminine genitive

m a d r a s [t] a l b u n i j j i 'the girl's school'

verbal possessive

d a r a s [t] u 'she learnt it m.'

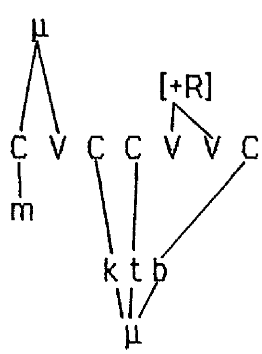
In Kusmi and Gabiini, [t] denotes feminine genitive in nominal forms, as in:

m a d r a s [t] u h 'his school'

m a d r a s [a t] a l ^{C} a j j a a l 'the children's school'

5.6. Distinct morphemic tiers:

The infixation, prefixation and suffixation of elements are each represented on separate morphemic tiers distinct from those of the consonantal root and the vocalic melody. It can be appreciated that [m] of [m]aktuub '(written) letter' is represented on a different tier to [m] of ʃi[m]ih 'he saw'. The associated representation of [m]aktuub is below:

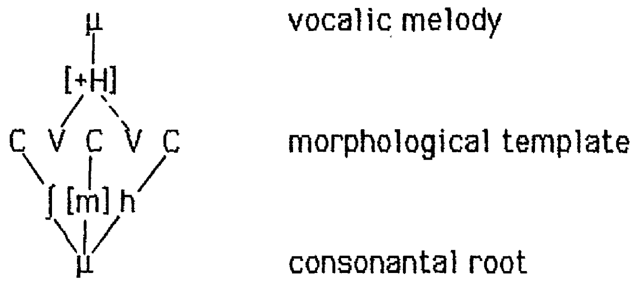


participle

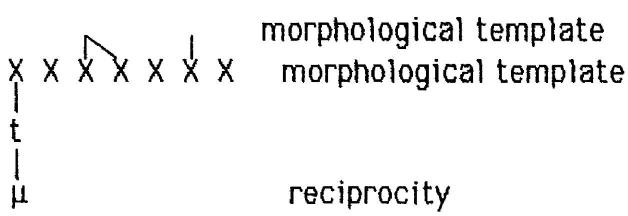
morphological template

consonantal root

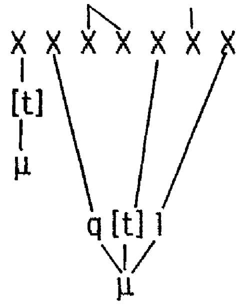
The consonantal root constitutes one morpheme (cf. 4.1.1.); the [m] of the participle is associated with a different morpheme. The [m] in ʃi[m]ih 'he saw', constitutes C_{ii} of the consonantal root morpheme, as seen in the associated representation below:



McCarthy considers that 'letters of increase' are acquired at an early stage in the derivation: all affixal material associates with the relevant slots prior to association of the consonantal root melody. Were the consonantal root melody to associate prior to the affix, it is suggested that there is nothing to preclude the initial element of the consonantal melody occupying the initial non-rhyme-headed X slot of the derived template. The [t] in [t]qaatal 'he fought with' is acquired, therefore, at a different stage to the [t] as a root consonant in qaa[t]al 'fight'. Consider the derivation of tqaatal 'he fought with'; the lexical information 'reciprocity' together with the structure of the morphological template suffices to specify that [t] occupies the initial skeletal slot:



Elements from the consonantal root then associate, on a one-to-one mapping from left-to-right, with the remaining non-rhyme-headed X slots:



morphological template

reciprocity

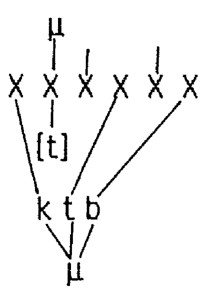
consonantal root

This provides the output: t q a a t a l to which a prothetic rhyme-headed X slot and then a prothetic non-rhyme-headed X slot will be added post-lexically in utterance-initial position.

In explaining the lack of application of cluster forming processes to the eighth binyan of k-t-b in Classical Arabic, McCarthy states that the two [t]s of the surface form are present on different morphemic tiers; cluster forming processes are possible only in case the elements concerned occupy the same morphemic tier:

> 'The eighth binyan <u>ktatab</u> does not become *kattab since the 1st <u>t</u> is affixal and the 2nd is radical.' (McCarthy 1981:398)

And as a result of these two [t]s being present at distinct morphemic levels, 'the (cluster forming) process fails to apply . . . the process applies only to template positions that are associated with the same element on the autosegmental tier' (McCarthy 1985:267), viz:



This is realised in CA following vowel and consonant prothesis in initial position as: (? i) k t a t a b 'he copied'. McCarthy continues:

> 'The same situation holds for V yatatabba^{C}u 'he will pursue' and VI yatataaba^{C}u 'he will succeed', where the second t is the first consonant of the root /tb^{C}/. The process also fails with maqatataa 'they (f. dual) detested' where the first consonant is part of the root /mqt/ and the second is an inflectional affix of the feminine.' (McCarthy 1981:398)

5.6.1. Tier morphology:

Certain skeletal morphological templates are provided onto which consonantal root melodies are mapped. The quality of segments to be realised on any additional slots of the new template is determined lexically. Where I shall now differ from McCarthy is in my interpretation of the use of labelled morphemic tiers, which, I suggest, negate the need for ordering of association: by making use of labelled morphemic tiers, there is no need to specify the ordering of affixal material in relation to that of the consonantal root: labelling delimits the slots which the consonantal root may occupy and eliminates the possibility that the first element of the consonantal root will associate with the initial slot of the derived template. In the formation of a noun of place from the first binyan, for example, the template provided contains two additional timing slots to the left of the imperfect stem of the first binyan:

X X X X X X	morphological template
μ	participle

Since these two slots are associated with the left-most morphemic tier, elements from the consonantal root are precluded from occupying these slots. The information [participle] (where [participle] includes nouns of place/instrument, in this case, as well as active and passive participles) is all that is needed to determine that the initial consonantal slot will be filled by a labial nasal [m]. To the left of a first binyan stem, the NSV associates with the rhyme-headed X slot; the consonantal melody associates with remaining non-rhyme-headed slots. The input to the noun of place of the consonantal root f-r-g is:

```
  μ                         participle
 /\
C V C C V C                 morphological template
|
m

    f r g
     \|/
      μ                     consonantal root
```

Following association and the application of redundancy rules, this will give: m a f r a g 'social room'

In the case of the verb of reciprocity, <u>tqaatal</u> 'he fought with', the picture is similar:

```
μ                           reciprocity
|
C C V V C V C               morphological template
|
t

   q t l
    \|/
     μ                      consonantal root
```

Following association and the application of redundancy rules, this will give: t q a a t a l 'he fought with'

In the post-lexical phonology, X and then X are prothesised in case the form occurs in initial position. The labelling of morphemic tiers thus provides the mechanism by which ordering of any kind is minimalised.

5.7. Consonantal melodies and their priviliges of occurrence:

If all additional slots of the new template are to be determined lexically, in the case of [t] a great deal of duplication will be encountered; for, of all the consonants occurring with morphological function, it is [t] which enjoys most priviliges of occurrence. Consider the set of consonantal melodies together with their priviliges of occurrence:

	inflectional verbal	nominal	verbal deriv.	deverbal denominal
j	{imp}			
?	{1 / imp}		{causative}	{elative}
n	{1 / Pl} {2 / Pl / (F) / (imp)} {Pl / F / (imp)}	{Pl}		
k	{1} {2 / (Pl) / (F)} {2 / F / (H.)}			
ʃ	{2 / F (G.)}			
t	{2 / F / (Pl) / imp} {F / imp[1]} {F / G} (H.)	{F / Pl} {F / G}	{refl} {rec} {denominal} {est}	
m	{Pl / (imp) / (2) / (K. opt. H.)} {2 / Pl}			{part}

1. {G} denotes {genitive}. In Kusmi and Gabiini, (imp) is bracketed since [t] denotes {feminine} in both perfect and imperfect aspects of the verb.

It will be necessary to stipulate for [feminine plural] and for [feminine singular] in the genitive case in nominal forms, for [feminine singular] and for [second] in the imperfect aspect of the verb, for [third feminine singular] in the perfect aspect of the verb in Kusmi and Gabiini, and for five distinct verbal templates that a voiceless coronal stop, [t], will associate with the consonantal slot. In the case of a verbal form like Hubaiʃi <u>tatqaatalein</u> (Kus./Gab. <u>tatqaataleen</u>) 'you f.pl. fight each other', three [t]s are realised with three distinct morphological functions - /t/ of the consonantal root, /t/ of reciprocity, and /t/ denoting [second person].

The many morphological functions of /t/ suggest (employing the criterion invoked in the introduction, cf. 0.4.1.4.3.) that this consonant is non-specified at some level. Further indication that 't' constitutes the default consonant at a certain level in the grammar lies in its prosodic function in young children's speech in and around the Hubaiʃi area: namely, in utterance-final position, [t] is frequently realised in place of the laryngeal [h]/[ʔ] of adult speech, viz:

? e i w a [t]] φ 'yes'

where the adult rendering is:

? e i w a [?]/[h]] φ 'yes'

Note must also be taken of Maltzan's observations made in 1873, that, in some North Yemeni dialects:

> 'was die Wortbildung betrifft, so finden wir oft den Vorsatz 't' in Wörtern, wo das Schriftarabische diesen nicht hat, z.B. <u>teras</u> für <u>ra?s</u> 'Haupt', <u>teben</u> für <u>ben</u> 'der Rabe' (bildlich)' (Maltzan 1873:245)

And, in light of the data presented in this thesis, it is possible to wonder whether 't' may have constituted the default consonant at all levels at one time - or, at least, whether a default rule for consonants once gave the default zone of constriction as [coronal] in both the post-lexical and lexical components, viz:

D.R. [ ] ---> [+Cl]

This question I leave open for further debate.

It is being suggested that the default consonant, '?', at the post-lexical level is not the default consonant at the lexical level, since, as far as frequency of occurrence and function in the lexical component is concerned, /?/ (together with /h/) constitutes one of the most highly-marked consonants. In light of the lexical rarity of the post-lexical NSC, a second consonant emerges which legitimately claims description as the default consonant at this level. Since the post-lexical NSC, identified above as '?', constitutes so rare a segment at the lexical level, and since, from evidence cited above, [t] could be said to constitute the default realisation of the NSC at the lexical level, it is necessary to revise the consonantal matrix displayed above (cf. 3.3.4., and repeated for convenience below) for the lexical component.

Consonantal matrix

	b	m	f	dh	th	t	d	s	z	n	l	r	ʃ	g	k	gh	x	Dh	T	S	H	^{c}	q	w	j	h	?
Cn	+		+								+	+		+	+												
V	+			+			+		+					+		+		+				+					
Sn											+														+		
Ct			+	+	+											+	+	+			+					+	
Sb								+	+				+							+							
N		+								+																	
Vb												+															
Rd																								+			
Lb	+	+	+																								
Cl				+	+	+	+	+	+	+	+	+	+					+	+	+							
P													+	+											+		
H															+												
U																+	+						+				
Ph																		+	+	+	+	+					
G																											
	b	m	f	dh	th	t	d	s	z	n	l	r	ʃ	g	k	gh	x	Dh	T	S	H	^{c}	q	w	j	h	?

5.8. The lexical NSC:

In order to capture the reality of the situation, I propose positing two NSCs, the operational sphere of each being confined to a particular level in the phonology thereby meeting the basic assumptions of lexical phonology. [t] represents the default realisation of the NSC at the lexical level, [?], the default realisation of the NSC at the post-lexical level. It will be appreciated that /t/ insertion differs from [?] insertion in that the latter is dependent solely on requirements of syllabification <u>outside the lexicon,</u> while the former is contingent on derivational rules and phonological processes <u>within the lexicon.</u>

By forwarding the notion of a NSC at the lexical level in contrast to the post-lexical level, the grammar is simplified considerably. It is claimed that where a template contains an obligatory X slot and does not lexically require that some particular segment associate with the consonantal slot, the NSC associates with that slot; where the X slot has been inserted lexically, the lexical NSC associates; where the X slot has been inserted post-lexically, the post-lexical NSC associates. Discussing the default consonant in Amharic, Broselow says that:

> 'C slots left empty because of an insufficiency of root Cs are filled by a default C, a mechanism employed in several areas of the grammar.' (Broselow 1984:17)

In view of the different 'letters of increase' in these Yemeni dialects (and, indeed, in dialects of Arabic in general), the lexical NSC associates with X only in case a language specific rule does not require a different 'letter'. This is in accordance with the Elsewhere Condition which states that:

5.8.1.

Lexical consonantal matrix

	b	m	f	dh	th	t	d	s	z	n	l	r	ʃ	g	k	gh	x	Dh	T	S	H	ᶜ	q	w	j	h	?
Cn	+		+								+	+		+	+												
V	+			+			+		+					+		+		+				+					
Sn											+														+		
Ct			+	+	+											+	+	+			+					+	
Sb								+	+				+							+							
N		+								+																	
Vb												+															
Rd																								+			
Lb	+	+	+																								
P													+	+											+		
H															+												
U																+	+						+				
G																					+	+				+	+
Ph																		+	+	+	+	+					
Cl																											
	b	m	f	dh	th	t	d	s	z	n	l	r	ʃ	g	k	gh	x	Dh	T	S	H	ᶜ	q	w	j	h	?

The Elsewhere Condition:

> Rules A, B in the same component apply disjunctively if and only if
>
> (i) The input of A is a proper subset of the input of B
>
> (ii) The outputs of A and B are distinct.
>
> In that case A (the particular rule) is applied first and if it takes effect, then B (the general rule) is not applied.
>
> (Archangeli 1984a:27,1984b:5 from Kiparsky 1984:3 and modified from Kiparsky 1973 and 1982b:8))

Since the consonantal matrix proposed for the post-lexical component (3.3.4.) would provide incorrect predictions at the lexical level, encouraging [ʔ] to associate with an obligatory C slot in derivational and inflectional processes where [t] is required, the above matrix is replaced by a consonantal matrix at the lexical level in which the NSC is realised as [t] following the application of all default and complement rules. The consonantal matrix at the lexical level appears as below:

Since the lexical NSC is not that segment which is realised by default as [?], but rather that which is realised as [t], [G] is distinctive in the lexical component and [Cl], the default zone of constriction at this level, is non-distinctive. Within the lexical component, the default zone of constriction is specified as [+Cl], viz:

5.8.2.

1. D.R. [ ] ---> [-Cl]/[___,+Lb/+P,+V/+H/+U/+G]
2. C.R. [ ] ---> [+Cl]

By stipulating that [-Cl] is assigned to consonants which have in their specifications [+G] it is possible to account for emphatic (pharyngealised) coronals. In this case [+Cl] will then be assigned by default to consonants which are specified [+Ph] as long as the feature [+G] is missing from their matrix specifications - thus /S,T, and Dh/ will not be affected by 1. but will be subject, by default, to 2. (This implies that pharyngealised labials, palatals or velars are rare.) The pharyngeal glides /H and ^{C}/, on the other hand, will be subject to 1. Remaining redundancy rules (as specified in chapter three, cf. 3.3.5.) operate as far as possible in the post-lexical component, subject to the Redundancy Rule Ordering Constraint (cf. 0.4.1.4.4.1.), to fully realise segments.

It is likely that /t/ will prove to be the lexical NSC in most, if not all, varieties of Arabic. Indeed, not only varieties of Arabic, but also varieties of other Semitic languages in which [t] associates with an obligatory consonantal slot when the root melody is insufficient to fill all slots by one-to-one association. This is the basis of Broselow's argument (1984) for the default consonant, [t], in Amharic. In common with /t/ of Hubaiʃi, Kusmi and Gabiini, the Amharic default consonant enjoys various morphological functions including:

i. marking passive-reflexive and reciprocal forms;

ii. a form of the third masculine singular pronominal suffix;

iii. the definite determiner when added to a relative verbal form;

iv. the 'missing' C_{iii} in weak verbs, but only in certain forms - this is a highly important role of /t/, eg.

s ä m m a	'he heard' (main verb)
s ä m [t] o	'he heard' (non-final)
m ä - s m a [t]	'to hear'

(Broselow 1984:23ff., Hayward, to appear)

It appears that Broselow is forwarding a similar claim for a lexical default consonant in Amharic as I am here for Hubaiʃi, Kusmi and Gabiini; in particular, in the light of her statement that filling of consonantal slots on templates can occur at different levels in the grammar. The characteristic functions of [t] mentioned for Amharic are more obviously lexical than post-lexical. She considers, however, the [t] of Amharic to equal in status the [?] of Arabic and German, for she continues to say:

> 'In Sierra Miwok, the default consonant is a glottal stop. This seems to be a more reasonable choice for a default consonant than [t], since it is in a sense an unmarked consonant. Thus, for example, it is a glottal stop which is inserted in a number of languages (including English and Arabic) phrase-initially in order to allow a syllable to begin with a consonant rather than a vowel.' (Broselow 1984:26)

Having specified that the filling of consonantal slots on the template may occur at different levels in the grammar, she now misses the important distinction between the default consonant, [?], in Arabic and English, where a slot is filled by [ʔ] in order to create a permissible syllable, and the default consonant, [t], in Amharic, where the consonant enjoys a morphological function. She fails to distinguish levels but, to all intents and purposes, we may well be discussing the same phenomenon.

At the post-lexical level, the zero-specified zone of constriction is held to be [guttural]. At the lexical level, this zone of constriction is marked and, in its place, the zero-specified zone of constriction is [coronal]. The lexical glottal stop is distinguished from the post-lexical NSC by presence of the feature [+G] such that, at the point where relevant rules apply, lexical /ʔ/ has the specification [+G] while the post-lexical glottal stop is totally devoid of specification underlyingly.

5.9. The lexical rarity of the post-lexical NSS:

It has been suggested, tentatively, in Hayward and Watson (to appear) that there may be a relationship between the lexical rarity of a segment and the selection of that segment as the post-lexical NSS of a given language.

> 'If a language develops a post-lexical:lexical distinction for NSSs, the segment which functions as NSS post-lexically will be one with a low lexical functional load.'
> (Hayward and Watson, to appear)

In Amharic, this is the case on the vocalic plane: the post-lexical NSV, realised after the application of redundancy rules as [ɨ], is extremely rare at the lexical level and this contrasts with the lexical frequency of [ä], held to be the lexical NSV. As observed in case of the NSV in the Yemeni dialects (realised, following the application of redundancy rules, as [a]), 'a' is non-specified at the lexical and the post-lexical levels, and so, on the vocalic tier in these Yemeni dialects, there is no correlation between the rarity of lexical selection and the choice of that segment as the post-lexical NSS. In contrast to the vocalic matrices of Amharic and the consonantal matrices of these Yemeni dialects, the Yemeni vocalic matrices are identical at both the post-lexical and the lexical levels.

5.9.1. Post-lexical specification:

As observed above, redundancy rules fill in the default zone of constriction of the lexical NSC in the lexical component (cf. 5.8.2.). Once the lexical default zone of constriction - in the present case, [+Cl] - has been specified, a post-lexical specification rule emerges for the post-lexical NSC, stating, in this case, that the default zone of constriction for the post-lexical NSC is [G], viz:

D.R. [ ] ---> [+G] (cf. Hayward, to appear)

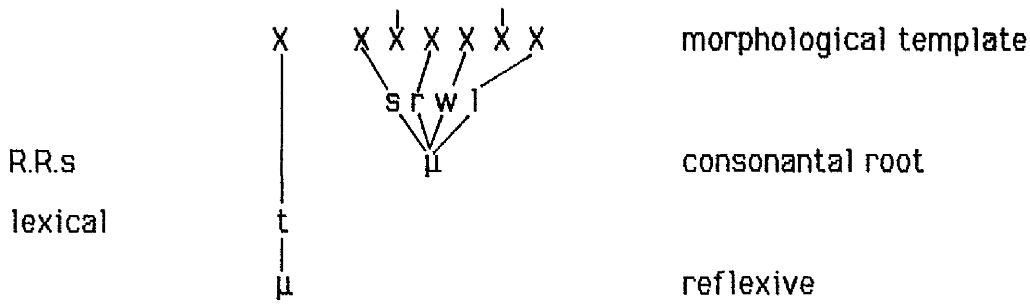
When lexical and post-lexical NSSs are identical, as in the vocalic systems in the present case, there is no post-lexical specification rule.

5.10. Application:

Let us look at the application of this analysis. Consider the formation of the following intransitive denominal verb in utterance-initial position:

[$_{\varphi}$ [? a] t s a r w a l 'he put on <u>sirwaal</u> (loose undertrousers worn by women in the mountain regions of North Yemen)'

Lexical component:



In the lexical component, some redundancy rules operate (cf. 5.8.2.) and [+Cl] is specified as the default zone of constriction, viz:

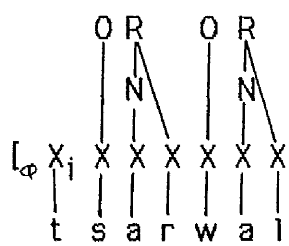
D.R. [ ] ---> [+Cl]

The output following tier conflation will be: t s a r w a l

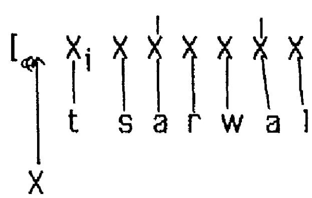
Post-lexical component:

In the post-lexical component, syllabification proceeds and remaining redundancy rules operate to fully specify all segments.

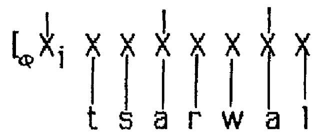
Syllabification:



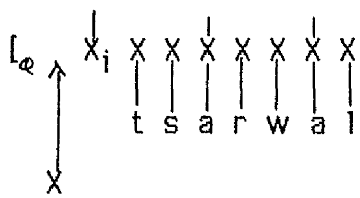
In utterance-initial position, the unsyllabified consonant to the immediate right of the phrase bracket triggers prothesis of an X slot:



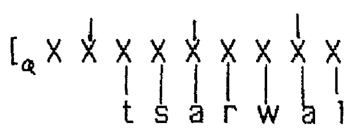
Since prothesis of X is triggered by an unsyllabified consonant, a rhyme-head is assigned. The NSV associates with the X slot:



Since an onsetless rhyme violates the Well-formedness Condition for syllabification (1.5.1.), the prothesised slot is also unsyllabified. The unsyllabified vowel triggers prothesis of an X slot:



This affects the template as below:



Since insertion of this X slot has been triggered by an unsyllabified vowel, no rhyme-head is assigned. The NSC associates with the X slot. The post-lexical specification rule is invoked to specify the default zone of constriction for the post-lexical NSC, viz:

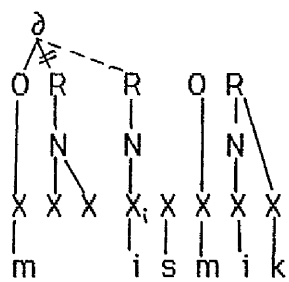
D.R. [ ] ---> [+G] (cf. 5.9.1.)

Remaining redundancy rules operate to realise the NSV as [a] and the NSC as [?] to provide a final realisation of:

$[_\varphi$? a t s a r w a l 'he put on <u>sirwaal</u>'

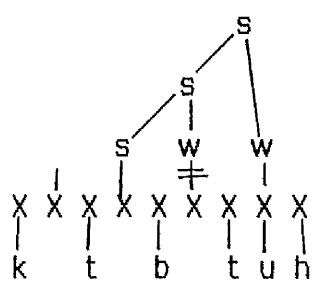
5.11. Implications:

The positing of a lexical NSC which has a different default realisation from the post-lexical NSC has implications for the deletion and the assimilation of /?/, which I want to examine now. In the case of /a/ - the NSV - deletion by means of R_i disassociation or syncope simply involves deletion of unassociated rhyme-headed X slots, viz:


--> m [i] s m i k 'what's your f.s. name'

(Hub.) (cf. 2.4.1.2.)

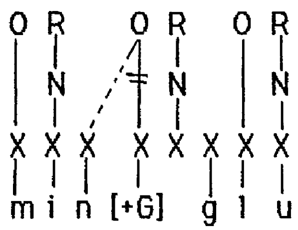
and


---> k a t a [b t] u h 'she wrote it m.'

(K./G.) (cf. 6.3.2.1.1.1.)

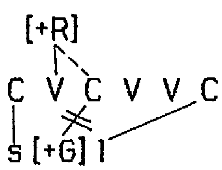
Deletion of /?/ (which is not the lexical NSC and is specified [+G]) is more complex. This process involves disassociation, not of an X slot with no associated features, but rather of an X slot together with its associated feature, [+G]. This need not deter us in the present analysis, however, since laryngeal disassociation where /?/ is involved is an exceptionless rule which occurs in the post-lexical component - i.e. at the stage by which the lexical NSC has been specified [+C1] and, therefore, all consonant phonemes have some specification. /?/ is no more specified than the lexical NSC by the post-lexical component and is significantly less specified than other consonant phonemes.

Laryngeal disassociation and resyllabification as it occurs in the syntactic concatenation of /min+?aglu/ in Hubaiʃi is illustrated below:



---> m i n a g l u 'for his sake'

Similarly, when [+R] or [+H] spread targets intervocalic /?/ in case one and only one of the adjacent vowels is /u/ or /i/, the feature [+G] must be disassociated prior to the application of spread. Spread does not target a non-specified segment. This is illustrated in the instance of <u>su[w]aal</u> 'question', below:



---> s u [w] a a l 'question'

Again, this is a post-lexical rule which applies whenever medial /?/ occurs in intervocalic position in case one and only one of the adjacent vowels is /i/ or /u/. (In intervocalic position where both /i/ and /u/ are involved spread from the more marked phoneme, /u/, takes precedence over spread from the less marked phoneme, /i/.) In the post-lexical component, although the post-lexical NSC - which is realised in the default case as [?] - associates with an epenthesised X slot, no consonant phoneme is totally unspecified.

It has been seen that the consonantal systems of Hubaiʃi, Kusmi and Gabiini boast two non-specified segments - one at the lexical level with a default realisation of [t], and one at the post-lexical level realised by default as [ʔ]. In chapter three, the case for positing a single NSS at the post-lexical level has been argued on the basis that [ʔ] constitutes the non-syllabic counterpart of [a] and the assignment of rhyme-heads is determined predictably according to the prosodic category of the unsyllabified segment which triggers NSS insertion. The post-lexical sameness in function of [a] and [ʔ], however, does not oblige us to say that, since the non-specification of 'ʔ' is restricted to the post-lexical component, non-specification of 'a' is only post-lexical. The high privilige of occurrence enjoyed by /a/ in the lexical component encourages us to claim that 'a' is the NSS of the vocalic system and is generally available to lexical and phonological processes (and cf. Hayward and Watson, to appear).

It is suggested that non-specification at more than one level in the grammar provides the mechanism to explicate certain relationships between various segments: in Yemeni Arabic, an explanation is provided for the relationship between the non-specified segments 'a', 't', and 'ʔ' and the minimally-specified 'h'. It is to be expected that a similar explanation may be found for the relationship between 'i', 't', 'ʔ' and 'h' in modern Egyptian dialects - and maybe, indeed, between similar segments in dialects of many other Semitic languages.

CHAPTER SIX

{Feminine} in the Perfect Aspect of the Sound Triliteral Verb and in Nominal Forms in Hubaiʃi and Kusmi

There are three aspects to this chapter: firstly, the establishment of an underlying representation for the {third feminine singular} subject pronoun in the perfect aspect of the sound triliteral verb in Hubaiʃi and in Kusmi[1]; secondly, an account of the relationship between the verbal {third feminine singular} and the nominal {feminine singular} morphemes in each of the two dialects; and, finally, an account of the relationship between {fem. sg.} in Kusmi and {fem. sg.} in Hubaiʃi. The chapter will be organised as follows: in the initial section, I shall introduce the verbal and nominal data for Hubaiʃi, suggesting the morphological and phonological environments in which variant forms occur. I shall then introduce verbal and nominal data for Kusmi. Having observed the environments in which variant forms are realised in the two dialects, the final section will be devoted to an analysis of the data. Within this section, I shall discuss the establishment of a single underlying representation for the verbal {third fem. sg.} subject pronoun in Hubaiʃi from which all surfacing variants are derived predictably. I shall then discuss the relationship between the verbal and nominal {fem. sg.} morphemes before continuing to analyse the Kusmi data in a similar way. In the conclusion, I shall evaluate the relationship between Hubaiʃi and Kusmi {fem. sg.} morphemes to conclude that, in spite of certain similarities, it is neither possible, nor is it desirable, to posit a single pandialectal representation from which all dialectal variants are derived predictably.

1. Gabiini {fm. sg.} morphemes have the same representation and, apart from lack of [+R] spread from {3 msc. sg.} obj. pronoun to [+H] verbal stem vowels in the {3 fm. sg.} inflectional form (cf. 6.2.1.), behave in the same way as the Kusmi {fm. sg.} morphemes presented here.

6.1. Hubaiʃi:

6.1.1. Verbal forms:

Let us firstly consider the surface forms of the [third feminine singular] inflectional form in the perfect aspect in Hubaiʃi:

6.1.1.1. The CiCiC verb type:

simi^{C}i garas	'she heard a bell'
simi^{C}ih/?	'she heard'
simi^{C}tu	'she heard it m.'
simi^{C}tanii	'she heard me'
simi^{C}tukum	'she heard you m.pl.'
maa simi^{C}iiʃ	'she didn't hear'

We need to specify which aspect of the verb we are interested in: as seen earlier in the examination of the triliteral verb (cf. 4.3.), the verb in the perfect aspect is reducible to a verbal stem and a subject pronoun:

simi^{C}	'he heard'
simi^{C}-um	'they heard'
simi^{C}-naa	'we heard'
simi^{C}-kum	'you m.pl. heard'
simi^{C}-kin	'you f.pl. heard'

As noted in chapter four, the [third masculine singular] inflectional form has no overt marker (cf. 4.3.), in common with most, if not all other modern dialects of Arabic. When the verbal stem is extracted as that part of the verb which all persons hold in common and morphemic tiers are labelled, the data appear as below:

μ [fem]

s i m i ^{C}[i] g a r a s 'she heard a bell'

μ [fem] μ [fem]

s i m i ^{C} [i h]] φ or s i m i ^{C} [i ?]] φ 'she heard'

μ [fem]

s i m i ^{C} [t] u 'she heard it/him'

μ [masc]

μ [fem]

m a a s i m i ^{C} [i i] ʃ 'she did not hear'

μ [neg]

Confining observation to the above data, there are five variants:

a) In utterance-final position, the final syllable is closed by a laryngeal - a glottal stop, [?], or a fricative, [h];

b) In phonological word-final position, the morpheme is realised as a simple vowel - [i];

b) Before a negative suffix - /ʃ/, the morpheme is realised as a long vowel - [ii];

c) Before an object pronoun, the morpheme is realised as [t].

6.1.1.2. The CaCaC verb type:

Observation of the CaCaC verb type demonstrates that the number of variants for [third feminine singular] is not confined to four. Consider the following data for the verb xabaz 'to bake'; morphological and phonological labels have been inserted:

μ [fem]
x a b a z [a] x u b z 'she baked bread'

μ [fem] μ [fem]
x a b a z [a h]]$_\varphi$ or x a b a z [a ʔ]]$_\varphi$ 'she baked'

μ [fem]
x a b a z [t] u 'she baked it m.'
μ [masc]

μ [fem]
m a a x a b a z [a a] ʃ 'she did not bake'
μ [neg]

There are five further variants of which only the pre-object pronoun variant, [t], is identical in both the CiCiC and the CaCaC verb types. These variants are:

a) In utterance-final position, the final syllable is closed by a laryngeal - a glottal stop or a fricative, to realise [ah] or [aʔ];
b) In phonological word-final position, the morpheme is realised as a simple vowel - [a];
b) Before a negative suffix - /ʃ/, the morpheme is realised as a long vowel - [aa];
c) Before an object pronoun, the morpheme is realised as [t].

6.1.1.3. Vowel quality:

The most obvious difference between realisations of the [third feminine singular] subject pronoun in the CaCaC and the CiCiC verb types is in vowel quality. When the morpheme occurs to the right of the CaCaC verb type, the vowel is realised as [a]; when the morpheme occurs to the right of the CiCiC verb type, the vowel is realised as [i]. Other attested data suggest that this vowel distribution is regular, eg:

f i r i H[i] f i r i H ʃ a d i i d	'she was very happy'
f i r i H[i] h/?]φ	'she was happy'
s a g g a l [a] ʃ a r i i T	'she recorded a cassette'
s a g g a l [a] h/?]φ	'she recorded'

The following generalisation may be made: when the verbal stem vowels are [+H], the suffix vowel is realised as [i], when the stem vowels are non-specified, the suffix vowel is realised as [a].

6.1.1.4. Pre-suffix vowel lengthening:

When the morpheme occurs to the left of a negative suffix, the vowel is durationally long. The question concerns whether this variant should be considered a <u>lengthened</u> variant, or whether the short vowel realisation in other positions should be considered a <u>shortened</u> variant. Observation of the behaviour of other vowel-final morphemes before a negative suffix or before a consonant-initial object pronoun which is final in the phonological word does suggest that a process of pre-suffix lengthening is available in this dialect just as it is in other modern dialects of Arabic.[1.] Consider the data below - lexical representations are given on the left, realisations on the right:

1. Broselow states for Educated Cairene Arabic that, when /ma . . . ʃ/ is added to a vowel-final verbal morpheme, 'the vowel, be it of the stem or the ending, lengthens' (Broselow 1976:70/72).

a) Verbal forms:

i.

/q a t a l u u + n i i/	q a t a l [u u] n i i	'they m. killed me'
/q a t a l u u + k u m/	q a t a l [u u] k u m	'they m. killed you m.pl.'
/q a t a l u u + n a a/	q a t a l [u u] n a a	'they m. killed us'
/w a l l u u + ʃ/	m a a w a l l [u u] ʃ	'they m. did not go'

ii.

/? a b S a r k i + n i i/	? a b S a r k [i i] n i i	'you f.s. saw me'
/? a b S a r k i + n a a/	? a b S a r k [i i] n a a	'you f.s. saw us'
/? a b S a r k i + ʃ/	? a b S a r k [i i] ʃ	'you f.s. didn't see'
/m a a + w a l l i + ʃ/	m a a w a l l [i i] ʃ	'he did not go'
/m a a + w a l l a + ʃ/	m a a w a l l [a a] ʃ	'she did not go'
/m a a + r a Dh a + ʃ/	m a a r a Dh [a a] ʃ	'she did not want'

b) Nominal forms:

/? a b u + n a a/	? a b [u u] n a a	'our father'
/? a b u + k u m/	? a b [u u] k u m	'your m.pl. father'
/? a x u + n a a/	? a x [u u] n a a	'our brother'

c) Prepositional forms:

/m a a + ^{C}a n d u + ʃ/	m a a ^{C}a n d [u u] ʃ	'he has not'
/m a a + b u + ʃ/	m a a b [u u] ʃ	'there is not'

In all these instances, the vowel remains durationally long (as in a)i.) or becomes durationally long (as in a)ii., b) and c)). The rule is exceptionless and applies to the final vowel of the penultimate morpheme in the phonological word. Consider the derivation of <u>mabSarnakiiʃ</u> 'we did not see you f.s.' below:

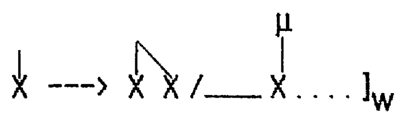
/? a b S a r n a a + k i/	? a b S a r n [a a] k i	'we saw you f.s.'

As a further suffix is added, the final vowel of the now penultimate morpheme is lengthened; the vowel of the antepenultimate morpheme in the word remains short if underlyingly short, or is shortened (by means of rhyme shortening, cf. 7.2.1.1.1.2.1.), if underlyingly long (as below):

/m a a + ? a b S a r n a a + k i + ʃ/ m a b S a r n [a] k [i i] ʃ 'we didn't see you f.s.'

The pre-suffix vowel lengthening rule is formalised as a nuclear increment rule below:

6.1.1.4.1. Pre-suffix lengthening:



6.1.1.5. Utterance-final rhyme branching:

It has been observed that pre-suffix lengthening is an active process in Hubaiʃi. This evidence, however, even together with the fact that the vowel of the (third feminine singular) subject pronoun is realised as long only in case it precedes a negative suffix, is not sufficient to establish that the vowel of this particular morpheme associates with a single X slot underlyingly (cf. qatal[uu]nii 'they m. killed me', and ?abSarn[aa]ki 'we saw you f.s.', above). The only means of establishing the length of the underlying vowel is by observing the behaviour of the [i] vowel variant in utterance-final position. As noted in chapter one, the syllable template for Hubaiʃi, as for Kusmi and Gabiini, stipulates that no vowel, whether durationally short or long, occurs in utterance-final position (cf. 1.3.2.4. and 1.4.5.4.). Should a vowel-final morpheme occur in utterance-final position, the vowel will be subject to diphthongisation, if long (1.3.2.3. and 2.1.1.2.1.); if short, one of the processes available is epenthesis of a non-rhyme-headed X slot to the right of the vowel followed by rhyme branching (cf. 1.3.2.1., 2.1.1.1.2. and 3.1.1.2.). Since diphthongisation of final /aa/ and rhyme branching in the case of final /a/ yield the same output, viz:

/? a b S a r n a a/ ---> ? a b S a r n [a ?] $]_{\varphi}$ 'we saw'

or ? a b S a r n [a h] $]_{\varphi}$ 'we saw'

/? a i w a/ ---> ? e i w [a ?] $]_{\varphi}$ 'yes'

or ? e i w [a h] $]_{\varphi}$ 'yes'

no insight will be gained as to the number of X slots occupied by the vowel of the (third feminine singular) morpheme if observation is restricted to the morph realised in the CaCaC verb type. Only by examining the morph realised in the CiCiC verb type is it possible to determine whether the vowel occupies one or two X slots underlyingly. If the vowel occupied two X slots, the expected realisation of 'she heard' would be:

*s i m i ^{C} [i j] $]_{\varphi}$

What is attested, however, is:

s i m i ^{C} [i h/?] $]_{\varphi}$ 'she heard'

Since rhyme branching in utterance-final position is confined to short vowels, it is claimed here that the vowel of the (third feminine singular) subject pronoun is underlyingly short. In phonological word-final position the vowel remains durationally short. It is subject to pre-suffix lengthening to the left of a negative suffix. In utterance-final position, rhyme branching occurs.

6.1.1.6. The [t] variant:

So far, the environments for the short vowel variant, the lengthened vowel variant and the vowel-laryngeal variant of the (third feminine singular) subject pronoun have been established. The matter now at hand is to establish the environment for the [t] variant.

The occurrence of [t] as a feminine marker is common to the majority of Semitic languages. Murtonen says in regard to the function of [t] in ancient Southern Arabic (i.e. South Arabian):

> 'To begin with the simplest feature, the distinction of gender in ancient Southern Arabic seems to have taken place always by the afformative -t, which can have been preceded naturally by a short vowel.' (Murtonen 1967:60)

And Beeston in Sabaic Grammar discusses the use of -[t] to indicate [feminine] in the perfect aspect of the verb and [t]- in the imperfect aspect (Beeston 1984:14-5). For nominal forms in Sabaic, he states:

> 'In general, nouns with a singular stem ending in -t are feminine, those without are masculine.' (Beeston 1984:27)

In contrast to the glottal stop realised in utterance-final position, [t] does not occur in response to the requirements of syllabification as observed in chapter five above: morphological information is required. Moreover, the specificity of the morphological information required in this case obviously exceeds the presence of 'simply another morpheme' in the phonological word: [t] does not surface to the left of a negative suffix, but only to the left of an object pronoun.

6.1.1.7. The status of suffixes:

The status of the negative suffix must be compared to the status of the object pronoun. The former may be affixed, not only to the right of a subject pronoun, but also to the right of an object pronoun, as in:

m a a ʃ i m i h k i n [i i] ʃ	'you f.s. didn't see me'
m a a s i m i ^{C} n [a a] ʃ	'he didn't hear us'

It is clear that the status of the negative suffix differs from the status of the object pronoun. I propose, therefore, to analyse affixation of the object pronoun as a level two operation, while analysing the affixation of the negative suffix as a level three operation (cf. 0.4.1.3.). (The affixation of the subject pronoun (inflection) being a level one operation.) In the light of this proposal, [t] is said to be realised to the left of a level two morpheme.

For dialects spoken in and around Ta^{c}izz in which the {third feminine singular} subject pronoun is said to be realised as [ah] in phonological word-final position (note, however, that it may well be <u>utterance-final</u> position), Diem observes:

> 'Vor Suffixen, die mit Konsonant beginnen, hat sie die Morphemvariante <u>-at-</u>, während sie vor Suffixen, die mit Vokal beginnen, die Form 'Verbalstamm vor den 1 und 2 Personen + <u>t</u>' hat.' (Diem 1972:313)

For the Ta^{c}izz dialect, the environment in which [t] occurs is again one of a specific morphemic level - namely, the level at which affixation of a object pronoun occurs.

Goitein's observations for the dialect of al-Gades lend support to our proposal regarding the role of morphemic levels: the subject pronouns for {first} and {second} and for all {plural} inflections are given as consonant-initial. Having noted the frequent use of [k] for /t/ in the speech of adults, Goitein records:

s a b b a r [k] a h a n 'she made them' (Goitein 1960:15/365)

The velar obstruent occurs to the immediate right of the verbal stem if and only if an object pronoun is added. Among speakers who render /k/ as [ʃ], the following forms are attested before object pronouns:

n a k k a ^{c} [ʃ] e h 'she has pulled out her eye'

l a b b a s [ʃ] a n i 'she dressed me' (Goitein 1960:16/366)

And the realisation of {third feminine singular} in the perfect aspect when final in the phonological word is given as [aa] in this dialect, as in:

q a a l [a a] 'she said'

q a a m [a a] s a a r [a a] 'she got up and went' (cf. Goitein 1960:380/381)

So, in al-Gades, as in Hubaiʃi, the {third feminine singular} subject pronoun is realised as a consonant when preceding an object pronoun.

Making reference to morphological and phonological information, the following claims about {third feminine singular} in the perfect aspect of the sound triliteral verb in Hubaiʃi can be made:

a) When final in the phonological word, the morpheme is realised as a vowel, the quality of which adopts the quality of the stem vowel such that: when the vowels of the verbal stem are /a/, the morpheme is realised as [a]; when the vowels of the verbal stem are /i/, the morpheme is realised as [i]).

b) In utterance-final position, ---]$_{\varphi}$, rhyme branching occurs and a laryngeal fricative or a glottal stop is realised to the right of the vowel. The rule for predicting vowel quality remains as in a) above.

c) Before a {negative} suffix (i.e. a level three morpheme), the vowel is subject to pre-suffix vowel lengthening in accordance with the general rule of pre-suffix lengthening in this dialect and in other dialects.

d) Before an object pronoun (i.e. a level two morpheme), the morpheme is realised as [t].

6.1.2. Nominal forms:

Having determined the environments in which the variant forms of the (third feminine singular) subject pronoun surface, consider the following nominal forms (where nominal is taken to mean all forms which may function as nouns):

m u d a r r i s	'a teacher m.'
m u d a r r i s [i]	'a teacher f.'
m u w a Dh Dh a f	'an employee m.'
m u w a Dh Dh a f [a]	'an employee f.'
t a a ^{C} i b	'tired m.s.'
t a a ^{C} i b i	'tired f.s.'

In order to derive a sound feminine noun, [a] is suffixed to a basic nominal stem when the final vowel of the stem is underlyingly non-specified; [i] is suffixed when the final vowel of the stem is underlyingly [+H]. The nominal stem, as for the triliteral verbal stem in the perfect aspect, is generally homophonous with that of the masculine singular noun. If one of these forms is placed in context and relevant phonological and morphological labelling is inserted, we observe:

μ (fem)

m u d a r r i s [i h]] φ 'a f. teacher'

or μ (fem)

m u d a r r i s [i ?]] φ 'a f. teacher'

μ (fem)

m u d a r r i s [i] m i n m a S r 'a f. teacher from Egypt' μ (fem)

m u d a r r i s [t] a l b u n i j j i 'the girl's f. teacher'

μ (fem)

m u d a r r i s [t] a n a a 'our f. teacher'

μ (first pl.)

The total (feminine) variants for nominal forms may be summarised as:

a) -[t] before a dependent word or before a possessive determiner.

b) -[i] when final in the phonological word if the final stem vowel is /i/.

c) -[a] when final in the phonological word if the final stem vowel is /a/.

d) -[ih] or [i?] in utterance-final position if the final stem vowel is /i/.

e) -[ah] or [a?] in utterance-final position if the final stem vowel is /a/.

Both the dependent noun and the possessive determiner are complements in genitive construction. It is maintained here that forms found in genitive construction are level two morphemes, just as the object pronoun is seen above as a level two morpheme (cf. 6.1.1.7.). It then appears that the allomorphy evident for (third feminine singular) is not peculiar to the perfect triliteral verb, but is shared by the nominal (feminine singular) morpheme. Jastrow noted the similar behaviour of (third feminine singular) verbal and (feminine singular) nominal forms for Gibla. He posits an ah - (a)t allomorph and suggests that the verbal form has been constructed on analogy to nominal forms (Fischer and Jastrow 1980:119). Behnstedt states for the dialect spoken in RaaziH that:

> 'In Rāziḥ vorliegende -a erinnert an die K-Dialekte des Süden und die Dialekte der Hugarīyah in deren sich die 3sg.f. an die Nominalformen angeglichen hat.' (Behnstedt 1987:29)

The claims made for (third feminine singular) are repeated, being generalised to [(third) feminine singular]:

a) When final in the phonological word, the morpheme is realised as a vowel, the quality of which reflects the quality of the (final) stem vowel.

b) In utterance-final position, rhyme branching occurs and a laryngeal fricative or a glottal stop is realised to the right of the vowel.

c) Before a [negative] suffix (i.e. a level three morpheme) the vowel is subject to pre-suffix vowel lengthening in accordance to a general rule of pre-suffix lengthening in this dialect and others.[1]

d) Before an object pronoun/possessive determiner or a dependent noun (i.e. a level two morpheme) the [feminine] morpheme is realised as [t].

The environments in which the variant realisations of the [(third) feminine singular] morpheme occur have been specified. There is still a need to establish an underlying representation of the morpheme from which all variants are derived predictably. This will be considered at a later stage.

6.2. Kusmi:

6.2.1. Verbal forms:

I now turn to examine comparable forms as they appear in Kusmi:

x a b a z [a t] x u b z	'she baked bread'
x a b a z [a t] a l x u b z	'she baked the bread'
x a b a z [t] u h	'she baked it m.'
s i m i ^{c} [a t] a S S o o t	'she heard the noise'
s i m i ^{c} [a t] n i i	'she heard me'
s i m i ^{c} [a t] k u m	'she heard you m.pl.'
s u m u ^{c} [t] u h	'she heard it m.'
maa simi^{c}[at]ʃ	'she didn't hear'

1. This will only affect the verb since nominal forms are not negated by affixation of a negative suffix (though pronominal forms are, as in man[ii]ʃ daarii 'I f. don't know', maa b[uu]ʃ 'there is not').

In order to reduce repetition to a minimum, I shall immediately divide the verbal stem from the (third feminine singular) subject pronoun and label phonological brackets and morphological tiers:

μ (fem)
x a b a z [a t] x u b z — 'she baked bread'

μ (fem)
x a b a z [a t] a l x u b z — 'she baked the bread'

μ (fem)
x a b a z [t] u h — 'she baked it m.'
μ (masc)

μ (fem)
x a b a z [a t]]$_{\varphi}$ — 'she baked'

μ (fem)
s i m i^{c} [a t] a S S o o t — 'she heard the noise'

μ (fem)
s u m u^{c} [t] u h — 'she heard it/him'
μ (masc)

μ (fem)
s i m i^{c} [a t]]$_{\varphi}$ — 'she heard'

μ (fem)
m a a s i m i^{c} [a t] ʃ — 'she didn't hear'
μ (neg)

In Kusmi, there are two variant realisations: [at] to the left of a consonant-initial suffix, when final in the phonological word, or in utterance-final position --]φ, and [t] to the left of a vowel-initial object pronoun. In addition, a change in vowel quality is noted when the verbal form juxtaposes a round vowelled suffix. This latter phenomenon was noted by Diem for the dialect spoken in Hadijja, a market town in Raima which borders the Tihaami coastal plane (Diem 1973); further data suggest that this is part of a right-to-left [+R] spread process which occurs from one morpheme to a [+H] vowel in the adjacent morpheme within the phonological word:

/ʃ i m i h + k + u h/	ʃ [u] m [u] h k u h	'you m.s. saw it/him'
/ʃ i m i h + k u m/	ʃ [u] m [u] h k u m	'you m.pl. saw' [1].

6.2.1.1. The [t] variant:

Consideration of the morpheme as it is realised before consonant-initial suffixes shows that the non-vowel-initial [t] variant of the (third feminine singular) subject pronoun in Kusmi is restricted in occurrence to the left of a vowel-initial object pronoun:

/k a l l a m a t + n i i/ --->	k a l l a m [a t] n i i	'she spoke to me'
/? a^{c} g a b a t + h u m/ --->	? a^{c} g a b [a t] h u m	'she/it pleased them m.'

Diem notes the same phenomenon for Gabal Raima - his data is from a speaker from al-MaHall - a village beside Gabiin 'markaz'.

^{c}a y y a n a t + o h	^{c}a y y a n [t] o h	'sie sah ihn'
^{c}a y y a n a t + n i i	^{c}a y y a n [a t] n i i	'sie sah mich'

(Diem 1973:85 (his transcriptions))

1. This process, which I analyse as an instance of 'parasitic' harmony, is dealt with and formalised in chapter eight (cf. 8.3.5.1.1.).

For dialects in which the non-suffixed form is realised as [at], a non-vowel-initial variant, [t], surfaces only in case a vowel-initial object pronoun is suffixed. It appears that different processes are available in Kusmi and Hubaiʃi to derive the non-vowel-initial [t] variant of {third feminine singular}. On the one hand, [t] features in all environments in the Kusmi {feminine} morpheme; and, on the other hand, the vowel of the morpheme is realised in Kusmi in all environments except to the left of a vowel-initial object pronoun.

6.2.2. Nominal forms:

Consider the following nominal forms for Kusmi, morphological information in the form of labelled tiers, and phonological information in the form of utterance-final brackets are inserted:

a)

μ {fem}

m a d r a s [a] m i n . . 'a school of . .'

μ {fem}

(ʔ a) l m a d r a s [a h]] φ 'the school'

μ {fem}

m a d r a s [a t] n a a 'our school'

μ {first pl.}

μ {fem}

m a d r a s [t] u h 'his school'

μ {masc}

μ (fem)

? i d a a r [a t] a l m a d r a s a 'the school's administration'

b)

(?) i b n 'son'

μ (fem)

(?) i b n [a] m i n . . . 'a daughter of . . .'

μ (fem)

(?) i b n [a t] i i 'my daughter'

μ (first)

As is the case for nominal forms in Hubaiʃi, in b), it is seen that affixation of a vowel to a basic (masculine singular) nominal form denotes (feminine singular): in contrast to Hubaiʃi, this vowel is invariably realised as [a] - it is unaffected by the quality of the final nominal stem vowel. [t] is realised to the immediate left of a genitive form - i.e. a dependent noun or a possessive determiner. To the left of a dependent noun or a possessive determiner [a] is realised unless the morpheme occurs to the left of the vowel-initial possessive determiner, in which case the morpheme is realised as [t]. Similarity in realisation between the verbal and nominal (feminine) morphemes in Kusmi lies in the fact that the affix vowel is subject to syncope in identical environments. [t], however, does not materialise in all positions in the nominal (feminine singular) morpheme, in contrast to [t] of the verbal morpheme. While [t] is indicative of the (third feminine singular) verbal and (feminine singular) nominal morphemes before an object pronoun/possessive determiner, in the case of the verb, [t] constitutes an integral part of the morpheme; in the case of the noun, the occurrence of [t] is dependent on the presence of a dependent noun or a possessive determiner. This suggests that the process operative in Kusmi nominal forms to derive the [t] and [at] variants is sensitive to more abstract morphological information than the process operative in verbal forms to derive [t] (as opposed to [at]). Because of the difference in the derivation of surface forms in nominal and verbal forms in Kusmi, it will only be possible to note shared similarities of nominal and verbal {feminine singular} morphemes in this dialect; it will not be possible to posit a single underlying representation for {(third) feminine singular}.

[t] (as opposed to [at]) is indicative of {third feminine singular} in the perfect aspect of the verb and of {feminine singular} in the noun to the left of a vowel-initial object pronoun/possessive determiner in both Hubaiʃi and Kusmi. A certain parallelism does exist between verbal and nominal forms in the two dialects. Differences in the degree to which the [t] variant occurs, however, and, in the relationship between nominal and verbal forms, suggests strongly that it may not be the same process that implements [t] realisation in both dialects.

6.3. Representation of the {feminine} morphemes in Hubaiʃi and Kusmi, or, a 'concrete approach' to dialectology:

In the following analyses, the verbal and nominal data from Hubaiʃi and Kusmi will be considered in order.

As far as the synchronic position in the dialects is concerned, it is not possible to claim that there is one pandialectal form from which all variants are derivatives; while a rule of syncope will be seen to derive [t] from /at/ as the morpheme occurs to the left of a vowel-initial object pronoun/possessive determiner in Kusmi, only a certain skewing of the data would enable a claim to be made for Hubaiʃi that /at/ is the lexical representation of [third feminine singular] in the verb and [feminine singular] in the noun. The following analysis facilitates an elaboration of certain shared similarities between the dialects and within the dialects between nominal and verbal forms. The analysis, which looks at the synchronic realities of the language, presumes that dialects of a language are 'networks of similarities and differences' (Hoppenbrowers 1982:61), and no more.

6.3.1. Hubaiʃi:

Given the different variants for [third feminine singular] in the perfect aspect of the verb and [feminine singular] in the noun in Hubaiʃi, the initial problem is to establish a representation from which all surfacing variants may be derived predictably. This involves an account of the relationship between the following realisations of the [feminine] morpheme:

verbal: [a], [ah], [a?], [i], [ih], [i?], [aa], [ii], [t]

nominal: [a], [ah], [a?], [i], [ih], [i?], [t]

Consider, in the first instance, the verbal data (repeated here for convenience). Relevant elements of the variants are provided in phonetic brackets.

6.3.1.1. Verbal data:

6.3.1.1.1. The CiCiC verb type:

s i m i ^{C}[i] g a r a s	'she heard a bell'
s i m i ^{C}[i h/?]] φ	'she heard'
s i m i ^{C}[t] u	'she heard it m.'
m a a s i m i ^{C}[i i] ʃ	'she didn't hear'

6.3.1.1.2. The CaCaC verb type:

x a b a z [a] x u b z	'she baked bread'

x a b a z [a ħ/ʔ]] ∅	'she baked'
x a b a z [t] u	'she baked it m.'
m a a x a b a z [a a] ʃ	'she did not bake'

As a first step in setting up for [third feminine singular] a representation from which all surfacing variants are derived predictably, the number and type of X slots in the representation must be established. The choices are as below:

i. two X slots or one;

ii. a non-rhyme-headed X slot;

iii. a rhyme-headed X slot;

iv. a rhyme-headed X slot followed by a non-rhyme-headed X slot;

v. two X slots linked to a single nucleus.

As has been seen, realisation of an utterance-final laryngeal constitutes a predictable process triggered by a final unsyllabified vowel (cf. 3.1.1.2.); therefore, a rhyme-headed X slot followed by a non-rhyme-headed X slot will not be posited in the underlying representation. Pre-suffixal vowel lengthening is both predictable and is not restricted to [third feminine singular] (cf. 6.1.1.4.1.); therefore, two X slots linked to a single nucleus will not be posited in the representation. A single X slot is posited. A return to the data suggests that it is more satisfactory to posit a rhyme-headed X slot in the representation since the consonant, [t], surfaces in one specified environment, while a vowel surfaces in all other environments - i.e. 'elsewhere'. The vowel variant constitutes the default or the general realisation in accordance with The Elsewhere Condition (cf. 5.8.), repeated below for convenience:

The Elsewhere Condition

Rules A, B in the same component apply disjunctively if and only if:

i. The input of A is a proper subset of the input of B;

ii. The outputs of A and B are distinct;

In that case A (the particular rule) is applied first and if it takes effect, then rule B (the general rule) is not applied.

6.3.1.2. Features in the representation:

A rhyme-headed X slot is posited in the underlying representation. The question now concerns the feature associated with this X slot: [+H] or nothing at all?

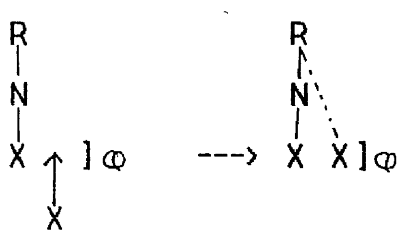
6.3.1.2.1. [+H] as the feature of the [feminine] morpheme vowel:

Were [+H] the feature of the representation such that /i/ constituted the underlying representation of [third feminine singular], consider the consequences:

6.3.1.2.1.1. Utterance-final position:

The utterance-final rhyme must branch. When a single rhyme-headed slot occurs in utterance-final position, the unsyllabified vowel triggers insertion of a non-rhyme-headed X slot at a low level in the derivation. This is followed by rhyme branching:

Rhyme branching:



(cf. 2.1.1.1.2. and 3.1.1.2.)

The NSC associates with the inserted X slot; this is realised by default as

[?]. If left-to-right [+Ct] spread applies, however, the segment is realised as [h] (cf. 3.2.1.).

[+Ct] spread:

```
[+Ct]            [+Ct]
 |  \              |
 V   C ] φ        [h]  ] φ
```

For this derivation, which applies at a low level in the derivation, the vowel of the underlying representation of (third feminine singular) could either be specified [+H] or be non-specified underlyingly.

6.3.1.2.1.2. Feature spread:

When the vocalic melody of the verbal stem is [+H], the affix vowel is realised as [i]; when there is no specified vocalic melody, the affix vowel is realised as [a]. It seems reasonable to assume that a process of feature spread operates from left-to-right spreading the feature matrix of the stem vowel onto the target affix vowel.

6.3.1.2.1.2.1. [+H] disassociation:

If [+H] were preassociated with the vowel of the morpheme, then [+H] would have to be disassociated in the environment of a verbal stem with no specified vocalic melody in order that the NSV associates with the rhyme-headed X slot and redundancy rules operate to realise the affix vowel as [a]. Disassociation would apply as below:

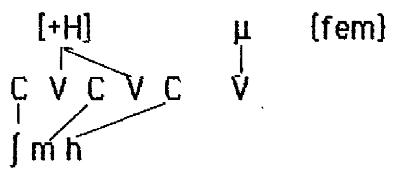
```
                  μ     (fem)
                  |
                [+H]
                  |
C V C V C         V
|  /   /
x b z
```

It is desirable to posit the least costly of solutions, and it does seem extravagent to disassociate a lexically-specified feature in order that the NSV associate with the rhyme-headed X slot. A less costly solution is to say that it is the NSV which associates with the X slot of the representation.

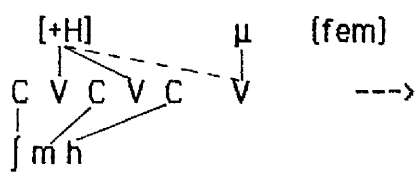
6.3.1.2.2. Non-specification of the [feminine] vowel:

6.3.1.2.2.1. [+H] spread:

With the NSV as the representation, consider the process of [+H] spread when the verbal stem vowels are marked [+H]:



The slot, (represented here as 'V'), is not associated with any feature; spread of [+H] operates from left-to-right, as below:



ʃ i m i h [i] 'she saw'

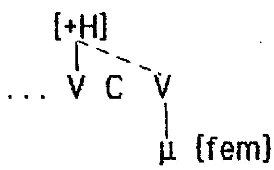
While the only evidence of [+H] spread in the post-lexical component is from a consonantal trigger to a contiguous NSV (as in the case of the imperfect prefix vowel, cf. 2.4.2.1.1.2.), [+H] spread does exist as an active process affecting [feminine] forms in the lexical component in Hubaiʃi. Not only is the vowel quality of [third feminine singular] dependent on the quality of the stem vowel, but also, as has been seen, regular [feminine singular] nominal forms demonstrate that the vowel quality of the affix is dependent on the quality of the final nominal stem vowel: when the stem vowel is marked [+H] underlyingly, the affix vowel is realised as [i]; when the stem vowel is non-specified underlyingly, the affix vowel is realised as [a], viz:

Nominal [+H] spread:

m u x a z z [i] n [i]	'qāt-chewer f.'
k a b [i i] r [i]	'(a) big (one) f.s.'
m a x b [a] z [a]	'bread-applier'

[+H] spread as it affects nominal forms is formalised as below:

[+H] spread:



as in:

/m u d a r r i s + X/	--->	m u d a r r i s [i]	'teacher f.'
/m u d i i r + X/	--->	m u d i i r [i]	'manager f.'

And in the case of the (second feminine plural) subject pronoun, when the vocalic melody of the verbal stem is [+H], the vowel of the affix is realised as [i]; when there is no specified vocalic melody, the vowel of the affix is realised as [a]:

s i m [i] ^{c} k [i] n	'you f.pl. heard'
x a b [a] z k [a] n	'you f.pl. baked'

[+H] spread as it applies in the former case is formalised as below:

[+H] spread:

```
          [+H]
           |`-.
     . . . V  C  V
                 |
                 µ   (2 fem pl.)
```

In all these instances, the underlying NSV of (feminine) forms is the target of [+H] spread. [+H] spread is generalised as below:

[+H] spread:

```
          [+H]
           |`-.
     . . . V  C  V
                 |
                 µ  (fem)
```

6.3.1.2.3. The [t] variant:

The analysis so far enables us to predict vowel lengthening in pre-suffix position (cf. 6.1.1.4.1.), epenthesis of a non-rhyme-headed X slot in utterance-final position (6.3.1.2.1.1.), and differences in vowel quality (6.3.1.2.2.1.). A problem emerges with the restricted occurrence of [t], however. I repeat the data for convenience.

r a S a d [t] u	'she wrote it m.s.'
ʃ i m i h [t] a n i i	'she saw me'
ʃ i m i h [t] u k u m	'she saw you m.pl.'
Dh a r a b [t] a h a n	'she hit them f.pl.'

As noted above, in many dialects of modern Arabic, including Kusmi, when the morpheme is realised as either [at] or [it] in phonological word-final position, the vowel of this form is realised in all environments except to the left of a vowel-initial object pronoun, viz:

k a t a b [a t]	k a t a b [t] u h	'she wrote it m.'

versus

ʃ i m i h [a t]   ʃ i m i h [a t] n i i   'she saw me'

In other dialects, such as al-^{c}Udain and Ta^{c}izz (cf. Diem 1973), where the {third feminine singular} subject pronoun is held to be [ah] or [a] when final in the phonological word, [at] is realised to the left of a consonant-initial object pronoun and [t] is realised to the left of a vowel-initial object pronoun. It could be argued that the underlying representation of the {third feminine singular} subject pronoun in these dialects is /at/ and that syncope is available in certain environments. Such a process is clearly not at work in Hubaiʃi, since [at] is realised in no environment. While positing /at/ as the underlying representation of the morpheme would go some way to solving a dilemma, it is submitted that it would be too abstract a solution to establish a form which was never manifested as such.

6.3.1.2.3.1. The lexical NSS:

A solution lies in maximal capitalisation of underspecification theory. As noted above (cf. chapter five), the NSV of the system is 'a'; in the lexical component, the NSC is /t/ and this is distinguished as such in a matrix within the lexical component. Segments such as [?] and /?/, which are segmentally and structurally identical but which function distinctly at the lexical and post-lexical levels have distinct lexical and post-lexical representations. In the post-lexical component, values for [coronal] and [guttural] are transposed. [Cl] is the default zone of constriction in the lexical component, viz:

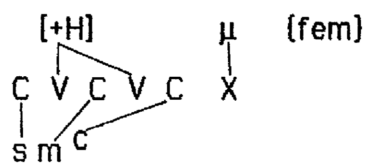
Lexical D.R.   [ ] ---> [+Cl] (cf. 5.8.2.)

In the post-lexical component, [Cl] is marked and a post-lexical specification rule stipulates that [G] is the default post-lexical zone of constriction:

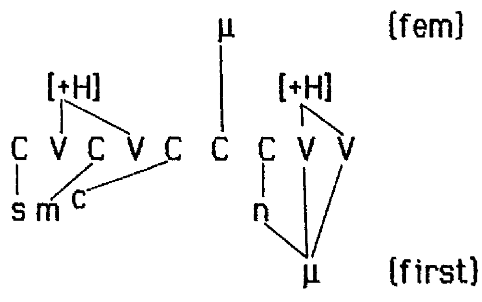
Post-lexical D.R. [ ] ---> [+G] (cf. 5.9.1.)

It is therefore proposed that the (third feminine singular) subject pronoun is represented lexically by a single X slot. When the form precedes an object pronoun (i.e. a level two morpheme), no rhyme-head is assigned. A default rule specifies [+Cl] in the lexical component after complement rules have supplied complementary values for all marked zones of constriction; further redundancy rules operate in the post-lexical component to fully realise [t]. In all other environments, a rhyme-head is assigned to the X slot. The NSV associates with the rhyme-headed X slot and is realised, in default of [+H] spread operating from an adjacent [+H] vowel, as [a]. Consider the derivation of simi^{C}tanii 'she heard me':

Lexical component:

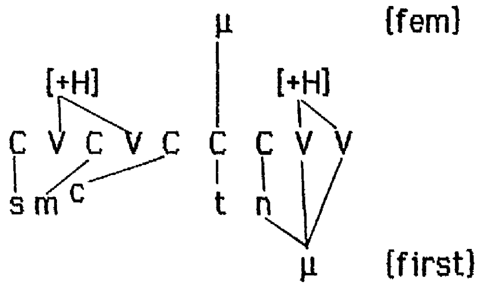


Affixation of an object pronoun:



To the left of an object pronoun, no rhyme-head is assigned (shown in the representation by changing 'X' to 'C'). Redundancy rules operate in the lexical component to stipulate the default zone of constriction as [+coronal], viz:

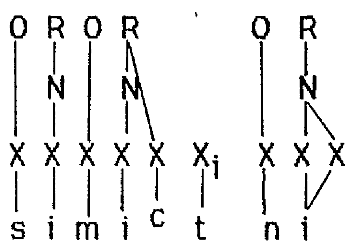
L.D.R. [ ] ---> [+CI] (cf. 5.8.2.)



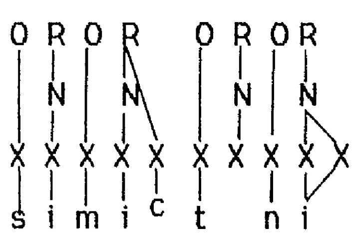
Post-lexical component:

Syllabification proceeds from left-to-right in accordance with the syllabification algorithm. Any unsyllabified element triggers insertion of an X slot. In this case, an impermissible sequence of three consonants is encountered:

Syllabification:



The unsyllabified consonant (X_i) triggers insertion of a rhyme-headed X slot. The NSV associates with the epenthesised X slot. Syllabification then applies again to produce a fully syllabified sequence, viz:

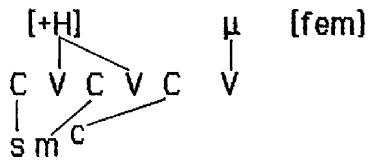


Redundancy rules operate to realise the NSV as [a] and to fill in residual feature-values for the non-specified consonant and for other segments.

The realised output is: [s i m i ^{c} t a n i i] 'she heard me'.

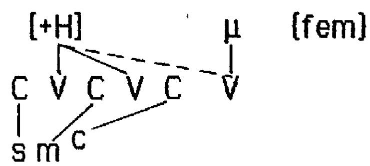
When the morpheme does not occur to the left of an object pronoun, a rhyme-head is assigned (shown in the representation by changing 'X' to 'V'):

Lexical component:



When the vocalic melody of the verbal stem is underlyingly [+H], as in the present case, [+H] spread takes place in the lexical component:

[+H] spread:



Post-lexical component:

In post-lexical component, phrase level brackets are inserted. Syllabification proceeds. Should any segment be unsyllabified, the unsyllabified element will trigger insertion of an X slot. The post-lexical NSS will associate with the inserted X slot. In utterance-final position, the final rhyme must branch. When a vowel-final form occurs in utterance-final position, the unsyllabified vowel triggers insertion of a non-rhyme-headed X slot, and rhyme branching is invoked (cf. 3.1.1.2.):

Rhyme branching:

```
O R O R O R
| | | | | |\
| N | N | N \
| | | | | |  \
X X X X X X  X ] φ
| | | | | |
s i m i C i
```

The NSC associates with the inserted X slot. [+Ct] spread then operates optionally from left-to-right (cf. 3.2.1.), when the realised segment will be [h]:

[+Ct] spread:

```
  |   |     |
X X X X X   X  X ] φ
| | | | |   |  /
s i m i C   i /
            |/
          [+Ct]
```

The output is as given below:

s i m i ^{C} i h] φ 'she heard'

This analysis captures a very real relationship between 't', 'h'/'?' and 'a' without necessitating an allomorphic 'via-rule', as might be posited in an analysis within the Natural Generative Phonology framework (Hooper 1976): 'a' and /t/ are both NSSs: 'a' is the NSV and /t/ is the lexical NSC; [?] is the default realisation of the post-lexical NSC; in utterance-final position, the unsyllabified vowel triggers insertion of an X slot. The NSC associates with this slot and may be realised by default as [?] unless the NSC is targeted by [+Ct] spread, in which case [h] will be realised.

6.3.1.3. The [feminine singular] morpheme in nominal forms:

From observation of the nominal forms, repeated below, we see that the analysis is applicable, not only to the (third feminine singular) verbal morpheme, but also to the (feminine singular) nominal morpheme. While it has frequently been suggested that the verbal form is constructed on analogy with nominal forms (cf. Fischer and Jastrow 1980:119, Behnstedt 1987:29), the analysis here claims that the grammar operates with one morpheme - namely, ((third) feminine singular), abbreviated as (feminine). Consider the data:

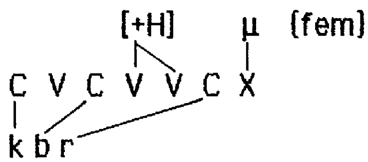
a) i.	m u d a r r i s	'a teacher m.'
ii.	m u d a r r i s [i h]]$_{\varphi}$	'a teacher f.'
iii.	m u d a r r i s [i ?]]$_{\varphi}$	'a teacher f.'
iv.	m u d a r r i s [t] a l b u n i j j i	'the girl's teacher f.'
b)i.	m u w a Dh Dh a f	'an employee m.'
ii.	m u w a Dh Dh a f [a]	'an employee f.'
c) i.	m a d r a s [a]	'a school'
ii.	m a d r a s [t] a n a a	'our school'
iii.	m a d r a s [t] a r w a	'the 'Arwa' school'
d) i.	g a b h [a]	'forehead'
ii.	g a b h [a t] h u m	'their forehead(s)'
iii.	g a b h [a t] a l ^{C} a j j a a l	'the boys' forehead(s)'
e) i.	k a b i i r	'(a) big/old (one) m.'
ii.	k a b i i r [i h]]$_{\varphi}$	'(a) big/old (one) f.s.'

Taking (feminine) as the generalised morpheme to which the processes outlined above apply, consider the derivations of e) ii. k a b i i r [i h]]$_{\varphi}$and d) ii. g a b h [a t] h u m:

i.	k a b i i r [i h]]$_{\varphi}$	'(a) big/old (one) f.s'

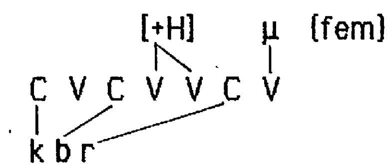
Lexical component:

An X slot is introduced onto the morphological template with the affixation of the (feminine) morpheme, viz:



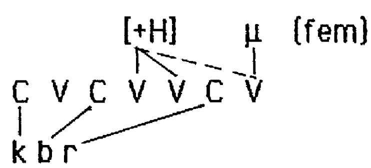
In the default case – i.e. in any environment other than to the left of a level two morpheme – a rhyme-head is assigned to the representation (shown in the representation by changing 'X' to 'V'). The NSV associates with this slot:

Rhyme-head assignment:



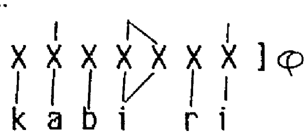
Left-to-right [+H] spread occurs from the final vowel of the nominal stem to the NSV target of the affixed morpheme:

[+H] spread:



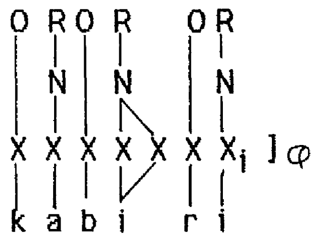
Post-lexical component:

Utterance-finality is indicated by means of bracketing in the post-lexical component:



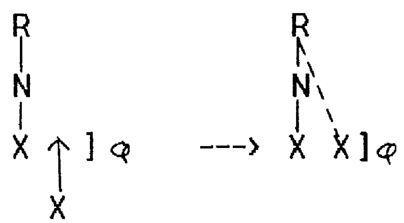
Syllabification proceeds from left to right:

Syllabification:



Since non-branching rhymes in utterance-final position are ruled out, the final vowel is unsyllabified in this position; insertion of an X slot is triggered by the unsyllabified vowel and rhyme branching is invoked to conform with the syllable template for the language:

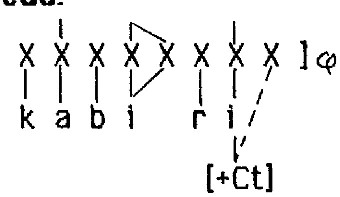
Rhyme branching:



(cf. 2.1.1.1.2. and 3.1.1.2.)

The NSC associates with the X slot and [+Ct] spread applies in this instance from the vocalic trigger to the NSC:

[+Ct] spread:



This produces, following the operation of remaining redundancy rules, the realised output: k a b i i r [i h]] φ '(a) big/old (one) f.s.'.

6.3.1.3.1. An apparent exception:

Consider the derivation of:

ii. g a b h [a t] h u m 'their m. forehead(s)'

Nominal forms with two contiguous consonants to the left of the (feminine) suffix present an apparent exception: in this case, it is [at] and not [t] which is indicative of (feminine). What will be seen, however, is that the pre-[t] vocalic slot has been inserted epenthetically in response to the requirements of syllabification. Consider the derivation:

Lexical component:

```
                µ          (fem)
                |
C  V  C  C  C    C  V  C
|     |  |       |  |  |
g     b  h       h  u  m
                  \ | /
                    µ      (masc)
```

Since the (feminine) morpheme occurs to the left of a possessive determiner, no rhyme-head is assigned (shown in the representation by changing 'X' to 'C'). The lexical NSC associates with the X slot. Redundancy rules operate in the lexical component to specify the NSC, by default, as [+coronal]:

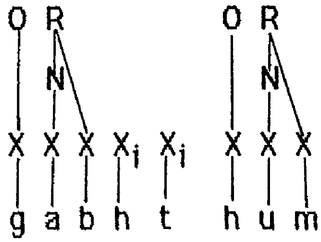
L.D.R. [ ] ---> [+Cl] (cf. 5.8.2.)

(Subsequent redundancy rules apply to yield [t])

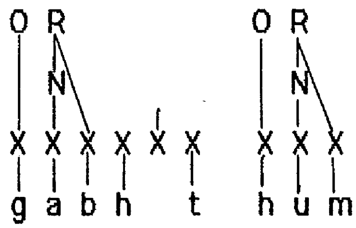
```
                µ          (fem)
                |
C  V  C  C  C    C  V  C
|  |  |  |  |    |  |  |
g  a  b  h  t    h  u  m
                  \ | /
                    µ      (masc)
```

Syllabification proceeds:

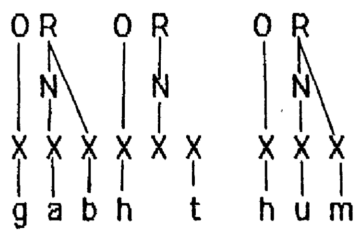
Syllabification:



A sequence of three or more contiguous consonants is impermissible. The unsyllabified element(s) triggers insertion of an X slot. Since insertion of this X slot has been triggered by an unsyllabified consonant, the X slot is assigned a rhyme-head, viz:



The NSV associates with the epenthesised X slot. Syllabification re-applies to produce the following fully syllabified output:



Remaining redundancy rules operate in the post-lexical component to realise the NSV as [a], to fill in remaining feature-values to fully specify other segments (and to realise the lexical NSC as [t]). The output is:

g a b h a t h u m 'their m. foreheads'

Now, while the construct variant, [at], of certain nominal forms such as gabha 'forehead' did initially appear to defy the proposal that a single entity (feminine) could be posited to which rules would operate regardless of whether the affixed element were nominal or verbal, the vowel of the [at] variant is analysed naturally by the mechanism at our disposal as the product of epenthesis. Projection of this vowel has been triggered by an unsyllabified consonant.

This analysis demonstrates that [t] is indicative of ((third) feminine singular) to the left of an object pronoun in Hubaiʃi. No specification of whether the affixed form is verbal or nominal is required since this additional morphological information is immaterial.

6.3.2. Kusmi:

In comparing the [(third) feminine singular] morpheme in Kusmi to that in Hubaiʃi, it is tempting to postulate similar processes by which the [t] variant to the left of a vowel-initial object pronoun/possessive determiner is derived in both dialects. The analysis here makes no such presumption. The same surface form in two dialects may be derived from similar, yet distinct underlying representations. Dialectal variation in this case is manifested, not through different ordering of the same rules applied to an identical underlying representation, but by each dialect having distinct morphological templates for the [feminine singular] morphemes. In Kusmi, it is observed that it is not possible to postulate one [feminine singular] morpheme to which all rules apply. While in Hubaiʃi a single [feminine singular] morpheme can be posited for nominal and verbal forms, in Kusmi, nominal and verbal [feminine singular] morphemes can only be said to share certain similarities. As has been observed above, the vocalic NSS, the post-lexical NSC and the lexical NSC have identical default realisations in Kusmi and Hubaiʃi (cf. chapters two, three and five).

The [third feminine singular] subject pronoun has two realisations - [t] before a vowel-initial object pronoun, and [at] in all other environments, as illustrated below:

```
i.                  µ        [fem]
                    |
     C V C V C C    V C          q a t a l [t] u h   'she killed him'
     | | | | | |    | |
     q a t a l t    u h
                    \/
                    µ    [masc]
```

ii.

```
                µ          [fem]
                |\
C V C V C V C              q a t a l [a t]   'she killed'
| | | | | | |
q a t a l a t
```

The nominal [feminine singular] morpheme has four distinct variants: these are, [t] to the left of a vowel-initial object pronoun, [at] to the left of a dependent noun or a consonant-initial possessive determiner, [a] in phonological word-final position and [ah] in utterance-final position, as in:

i.

```
                  µ         [fem]
                  |
C V V C V C C    V C        w a a l i d [t] u h   'his mother'
| |/  | | | |    | |
w a   l i d t    u h
                  \/
                  µ    [masc]
```

ii.

```
                µ              [fem]
                |
C V V C V C V C C V V          w a a l i d [a t] n a a   'our mother'
| |/  | | | | | | |/
w a   l i d a t n a
                   \/
                   µ           [first pl.]
```

iii.

```
                µ         [fem]
                |
C V V C V C V             w a a l i d [a]        'a mother'
| |/  | | | |
w a   l i d a
```

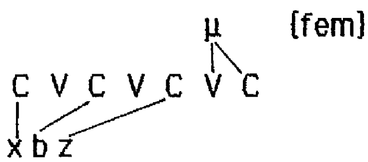
iv.

```
                 µ        [fem]
                / \
C V V C V C V C ] φ       w a a l i d [a h] ] φ     'a mother'
| |/  | | | | |
w a   l i d a h
```

Note that, while [a?] does occur as an utterance-final variant, it does so rarely; in the general case, [+Ct] spread applies in utterance-final position in Kusmi (as in Gabiini) whenever the structural description is met.

6.3.2.1. [Third feminine singular]:

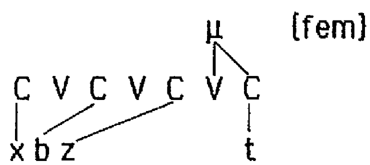
Let us firstly consider the variants of the [third feminine singular] morpheme. The template of this morpheme is posited as a rhyme-headed X slot followed by a non-rhyme-headed X slot which affix to the right of the verbal stem, viz:



The lexical NSSs associate with these rhyme-headed and non-rhyme-headed X slots. As in Hubaiʃi, redundancy rules in the lexical component specify the default zone of constriction for consonants as [+coronal], viz:

L.D.R. [ ] ---> [+Cl] (cf. 5.8.2.)

(Subsequently realised as [t])



In the post-lexical component, remaining redundancy rules operate to fully specify segments, and provide the realisation below:

x a b a z a t 'she baked'

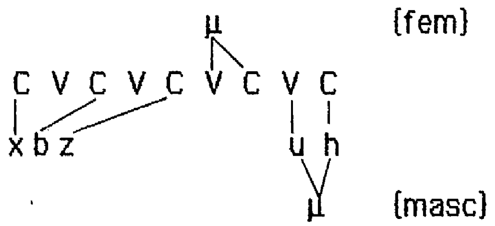
In a verb in which the stem vowels are specified [+H] underlyingly, there is no evidence of [+H] spread, as seen in: <u>simi^{C}[at]</u> 'she heard'. In contrast to Hubaiʃi, the vowel of the Kusmi [third feminine singular] morpheme is not sensitive to [+H] spread. In this dialect, the spread of vocalic features in the lexical component will be seen to be 'parasitic' on the presence of some contextual feature shared by trigger and targets (cf. 8.3.5.1.).

6.3.2.1.1. The [t] variant:

6.3.2.1.1.1. Syncope:

When the morpheme occurs to the left of a vowel-initial object pronoun, the vowel of the representation does not materialise. The vowel is subject to syncope following syllabification and stress assignment, and resyllabification takes place. Consider the full derivation:

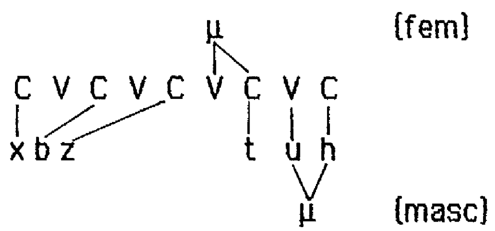
Lexical component:



Lexical redundancy rules operate to specify the default zone of constriction as [+coronal], viz:

L.D.R. [ ] ---> [+Cl] (cf. 5.8.2.)

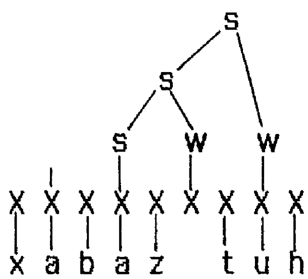
(Subsequently realised as [t])



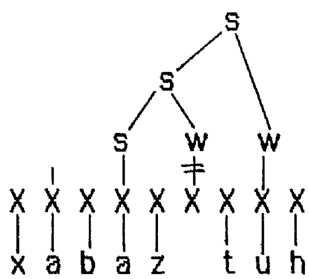
Post-lexical component:

Syllabification proceeds followed by assignment of word stress in the post-lexical component. Stress assignment follows the algorithm for stress as detailed in chapter one: if there is no final superheavy syllable and no non-final heavy syllable in the phonological word, then stress is assigned to the first syllable or to the antepenultimate syllable, whichever is right-most (cf. 1.4.3.2.). Syncope then applies to delete the stressless vowel. This is diagrammed below:

Stress assignment:

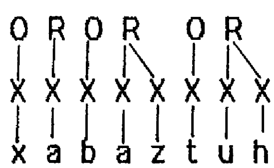


Syncope:



The output of syncope is syllabified as below:

Syllabification:

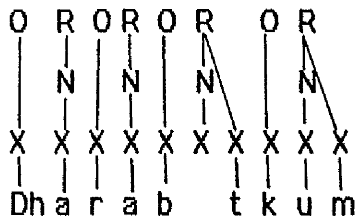


Remaining feature-values are filled in by redundancy rule to provide an attested realisation of: x a b a z [t] u h 'she baked it m.'

6.3.2.1.2. The [at] variant:

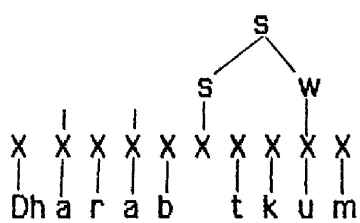
In case of the morpheme juxtaposing a consonant-initial suffix (object pronoun or negative suffix), syllabification applies as below.

Syllabification:



Since there is no ultimate superheavy syllable, stress is assigned to the right-most heavy syllable (in this case, the penultimate syllable). Syncope, therefore, does not take place in this instance.

Stress assignment:



Following the operation of all requisite redundancy rules, the output is as below:

Dh a r a b [a t] k u m 'she hit you m.pl.'

6.3.2.2. The {feminine singular} morpheme in nominal forms:

As we turn to consider the nominal {feminine singular} morpheme, consider the data, which I repeat below for convenience:

m u x a z z i n [a h]] φ 'a female qāt-chewer'

m u x a z z i n [a] m i n . . 'a female qāt-chewer from/of . .'

m u x a z z i n [a t] n a a 'our female qāt-chewer'

m u x a z z i n [t] u h 'his female qāt-chewer'

The data illustrate that it is not possible to posit a single nominal/verbal representation for {feminine singular} in Kusmi. While [t] appears in all variants of {third feminine singular} in the perfect aspect of the verb, in nominal forms, [t] is indicative of {feminine singular} if and only if it occurs to the left of a genitive form - i.e. a dependent noun or a possessive determiner. As is the case with verbal forms, [+H] spread does not apply when the final stem vowel is underlyingly [+H].

The template for the nominal {feminine singular} morpheme is posited as a single rhyme-headed X slot. The NSV associates with this rhyme-headed X slot. To the left of a possessive determiner or a dependent noun, a non-rhyme-headed X slot is inserted to the right of the vowel. The lexical NSC associates with this X slot. The NSC is realised, predictably, as [t]. When the possessive determiner is vowel-initial, syllabification followed by stress assignment takes place and the vowel of the original {feminine} morpheme is subject to syncope as illustrated for the verbal {feminine} morpheme above (cf. 6.3.2.1.1.1.). Stress shift may apply subsequently. When the morpheme occurs in utterance-final position, the unsyllabified vowel triggers insertion of an X slot. The post-lexical NSC associates with the inserted X slot. Since [+Ct] spread applies in Kusmi whenever the structural description is met, the NSC is targeted by [+Ct] spread after [+Ct] has been assigned to the vowel by default to provide an utterance-final realisation of [ah]]φ, as in:

m u x a z z i n [a h]]φ 'a female qāt-chewer'

Consider the derivation of <u>muxazzintuh</u> 'his female qāt-chewer':

Lexical component:

Affixation of the [feminine] morpheme to the nominal stem:

```
                             µ  [fem]
                             |
C V C V C C V C  V
| | |   |/  | |
m u x   z   i n
```

The NSV associates with the rhyme-headed X slot (represented in the present case as 'V'). Suffixation of a possessive determiner then occurs, triggering the insertion of a non-rhyme-headed X slot ('C'), viz:

```
                             µ          [fem]
                             |
C V C V C C V C  V  ↑  V C
| | |   |/  | |     |  | |
m u x   z   i n     |  u h
                    |   \|
                    C    µ  [masc]
```

The NSC associates with the inserted X slot. Lexical redundancy rules serve to specify the default zone of constriction as [+coronal], viz:

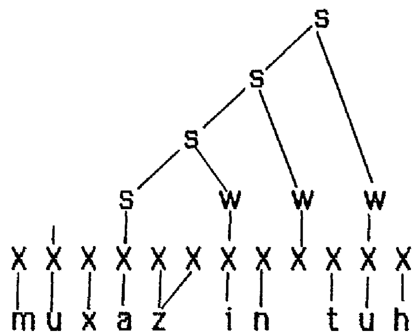
L.D.R. [ ] ---> [+Cl] (cf. 5.8.2.)

```
                             µ          [fem]
                             |
C V C V C C V C  V C V C
| | |   |/  | |    | | |
m u x   z   i n    t u h
                      \/
                      µ    [masc]
```

Post-lexical component:

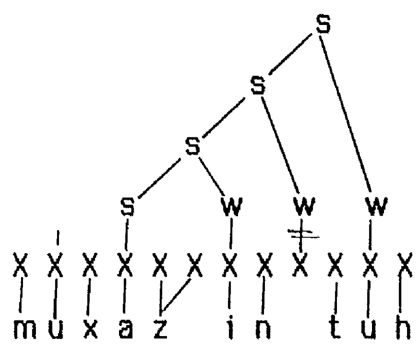
Syllabification proceeds followed by assignment of stress. In accordance with the stress algorithm for the language, where there is no final superheavy syllable, stress is assigned to the right-most heavy syllable, viz:

Stress assignment:



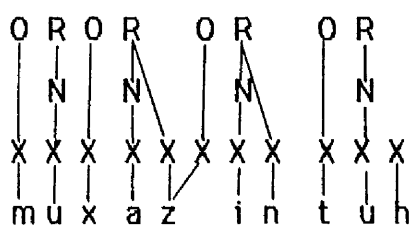
The [i] vowel, though unstressed, cannot be subject to syncope since the output of syncope would violate the Well-formedness Condition for syllabification (cf. 1.5.1.). It is the unstressed NSV, therefore, which is subject to syncope. This is diagrammed below:

Syncope:



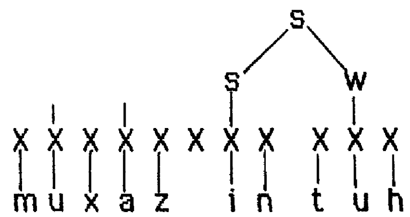
The output of syncope is syllabified as below:

Syllabification:



Since the right-most heavy syllable following syncope is no longer that which was originally stressed, stress assignment reapplies, viz:

Stress assignment:



Remaining redundancy rules specify absent feature-values to provide a fully syllabified output of:

m u x a z z i n t u h 'his female qāt-chewer'

In contrast to Hubaiʃi, Kusmi does not have a single underlying representation for [(third) feminine singular]; [t] is an intrinsic part of the verbal [third feminine singular] morpheme, yet in the nominal [feminine singular] morpheme, [t] is realised only to the left of a possessive determiner or a dependent noun. The [t] variant (as opposed to [at]) to the left of a vowel-initial possessive determiner in nominal forms is derived by means of syncope which applies in the same way as for the verbal [third feminine singular] morpheme.

In suffixed verbal and nominal forms where the object pronoun/possessive determiner is vowel-initial, realisations in both dialects are identical; yet the derivations of each require that distinct processes act on distinct representations. [+H] spread occurs in Hubaiʃi where lexical spread processes are not always parasitic on the presence of a contextual feature. In Kusmi, lexical spread processes are invariably parasitic on the presence of a contextual feature shared by target and trigger segments, and so, [+H] spread does not occur in this position (cf. 8.3.5.1.1.).

Although the {feminine} morpheme has identical realisations in the Kusmi and Hubaiʃi forms xabaz[t]u(h) 'she baked it m.' and katab[t]u(h) 'she wrote it m.', muxazzin[t]u(h) 'his f. qāt-chewer' and waalid[t]u(h) 'his mother', these forms have resulted independently from independent representations. As far as the synchronic position on the dialects is concerned, the present analysis does not presume that there is one pandialectal representation from which all variants are derived. This analysis elaborates the concept that dialects of a language are 'networks of similarities and differences' by observing the synchronic realities of the dialects concerned rather than confusing synchronic reality with diachronic development.

CHAPTER SEVEN

The 'Weak' Verbs

In chapter four I considered perfective inflection in the sound triliteral verb type. In this chapter, I shall examine inflection in the perfect aspect in those verb types which do not fall into the sound triliteral verb category. It will be observed that perfective inflection takes place in these verb types in the same manner as for the sound triliteral verb. The subject pronoun is suffixed to the verbal stem. As will be seen, however, certain structural changes occur in the verbal stem in a number of inflectional forms. The three verb types examined here have been traditionally termed 'hollow', 'third weak' or 'defective' and 'doubled'. For Classical Arabic and the dialects, the first two verb types treated have been classified as 'weak', due to the 'loss of a weak radical' - either /w/ or /j/ in certain forms. Within the traditional framework, it is assumed that all verb types fit into the (unmarked) sound triliteral verbal pattern. In what follows, I claim that these 'weak' verb types do not all fit into the sound triliteral verbal pattern today. Differences between the 'weak' verb types are explicable in terms of differences in the form of the consonantal melody and in the template of the verbal stem.

Note that, as in examination of the sound triliteral verb above, I am not concerned with discrepancies in vowel distribution such as occur in the verbal stem of (first singular) inflectional forms. These will be handled in detail in chapter eight.

7.1. The hollow verb:

In the first instance, I shall examine paradigms of the verb type which has been termed 'the hollow verb' traditionally. The selected verbs are saar 'to go' and gaal 'to say'. Surface data will be examined from Kusmi and Gabiini and Hubaiʃi respectively. Note that '-' divides the subject pronoun from the verbal stem (as in 4.3.2. and 4.3.3.):

Kusmi:

		pl.
1.	s u r - [k^W]	s i r - n a a
2.m.	s i r - k	s i r - k u m
2.f.	s i r - [tʃ]/[k_j]	s i r - k u n
3.f.	s a a r - a t	s a a r - e e n
3.m.	s a a r	s a a r - u m

Gabiini:

		pl.
1.	s i r - k	s i r - n a a
2.m.	s i r - k	s i r - k u m
2.f.	s i r - ʃ	s i r - k u n
3.f.	s a a r - a t	s a a r - e e n
3.m.	s a a r	s a a r - u u

Hubaiʃi:

		pl.
1.	s u r - k	s i r - n a a
2.m.	s a r - k	s i r - k u m
2.f.	s i r - k i	s i r - k i n
3.f.	s a a r - a	s a a r - e i n
3.m.	s a a r	s a a r - u u/m

Consider now the paradigms for gaal 'to say':

Kusmi:

		pl.
1.	q u l - [k^W]	q u l - n a a
2.m.	q u l - k	q u l - k u m
2.f.	q u l - [tʃ]/[k_j]	q u l - k u n
3.f.	q a a l - a t	q a a l - e e n
3.m.	q a a l	q a a l - u m

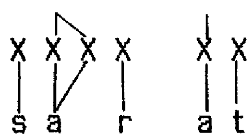
Gabiini:

		pl.
1.	q u l - k	q u l - n a a
2.m.	q u l - k	q u l - k u m
2.f.	q u l - ʃ	q u l - k u n
3.f.	q a a l - a t	q a a l - e e n
3.m.	q a a l	q a a l - u u

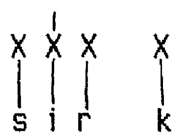
Hubaiʃi:

		pl.
1.	q u l - k	q a l - n a a
2.m.	q a l - k	q a l - k u m
2.f.	q a l - k i	q a l - k a n
3.f.	q a a l - a	q a a l - e i n
3.m.	q a a l	q a a l - u u/m

In the case of all three dialects the subject pronouns are identical in the sound triliteral and the 'hollow' verb types. It can be inferred that inflection is also identical. However, while I maintain that the process of inflection in this verb type is identical to the process of inflection in the sound triliteral, it will be appreciated that the vowel of the stem is shortened to the left of a consonant-initial subject pronoun, and the quality of the vowel is changed in Kusmi and Gabiini (in Hubaiʃi, the quality of the vowel is frequently, but not always, changed). In a structuralist analysis, two distinct allomorphs would be posited for the verbal stem: these allomorphs appear in Gabiini and Kusmi as in the following examples:



'she went'



'you m.s. went'

7.1.1. Traditional underlying 'root and pattern' theory:

Traditionally, alternations in the vowel of the verbal stem - a feature of Classical and Modern Standard Arabic (cf. Haywood and Nahmad 1962:224, Ziadeh and Winder 1958:65, Cowan 1958:61-2,114, Wright 1971:83), and thus, by no means something peculiar to these Yemeni dialects - are explained as follows:

> 'the hollow verbs are those of which the middle radical is one of the weak consonants w and y.' (Cowan 1958:114)

Bakalla classes hollow and third weak verbs under one term for Makkan Arabic, for example:

> 'take the weak /sala/ 'he grilled' and /sa:l/ 'it flowed' (both have lost the segment [y] as their third and second radical respectively).' (Bakalla 1979:120)

All suggestions assume that forms like naama 'he slept' and qaama 'he got up' in Classical and Modern Standard Arabic are constructed on the basis of

*/nawim+a/ and */qawam+a/ respectively. It is assumed that a non-geminate high vocoid does not actually occur between two short vowels of which the left-most, at least, is fatHa (/a/). C_{ii}, when either /j/ or /w/, is therefore subject to deletion in this position (cf. Cowan 1958:61). The vocoid (in traditional terms, 'the weak radical') often crops up in the verbal noun of the first binyan, as a long vowel in the imperfect aspect of the first binyan, and in some derived binyanim. The vocoid is also realised as the vowel of the perfect stem when the subject pronoun is consonant-initial. However, although it is assumed that <u>kuntu</u> 'I was' in Classical and Modern Standard Arabic is derived from */kawan+tu/, for example,[1] no satisfactory account has yet been given to explain quite how the medial vocoid is realised as a vowel in the {first}, {second} and {third feminine plural} inflectional forms in the perfect aspect of the verb.

Also, in many of these hollow CA and MSA forms, the long vowel of the imperfect aspect and of the verbal noun and the vocoid of derived verbs are not so easily relatable, viz:

<u>to sleep</u>

n a a m a 'he slept' n [i] m t u 'I slept' j a n [a a] m u 'he sleeps'

n a [u] m/n i [j] a a m 'sleep (v.n.)'

n a [w w] a m a 'he makes sleep'

<u>to fear</u>

x a a f a 'he feared' x [i] f t u 'I feared' j a x [a a] f u 'he fears'

x a [u] f 'fear (v.n.)'

1. Wright states that the influence of /w/ is strong enough to have changed the fatHa (/a/) of the first radical into Damma ([u]) (Wright 1971:84), and Cowan notes the 'short <u>u</u> to which the middle radical <u>w</u> shrinks in the first and second persons and in the third p. plural feminine' (Cowan 1958:61).

And in some cases, the medial vocoid may be realised as [j] or as [w] in certain binyanim and in certain derivatives with little or no difference to the meaning, viz:

<u>to change</u>

H a a l a	'he changed'	H [u] l t u	'I changed'	j a H [u u] l u	'he changes'

H a [i] l u u l a	'change (v.n.)'
t a H a a [w] a l a	'to try, endeavour'
t a H a a [j] a l a	'to employ artful means, to endeavour'
t a H a [w w] a l a	'to proceed cunningly'

H a [u] l	'might, power'	H a [i] l	'strength, power'

In addition, the vocoid is realised in intervocalic position when the final element of the consonantal root is said to be weak (i.e. /j/ or /w/), viz:

h a [w] a a	'he dropped, fell, tumbled'

This is also attested in the Yemeni dialects examined here, viz:

(? a) s t a [w] a	'it was ready' (Kus./Gab.)
(? a) s t a [w] i	'it was ready' (Hub.)
h a [w] a a	'wind, air'

I have been able to locate no CA verbs of the 'fa^{c}ala' pattern where C_{ii} is realised as [w] or [j] and C_{iii} is not weak - i.e. neither /w/ nor /j/ - however, there are some CA verbs of the pattern 'fa^c[i]la' (the same pattern as the alleged */xawif+a/ for <u>xaafa</u> 'he feared', and */nawim+a/ for <u>naama</u> 'he slept') where C_{ii} is realised as [w] or [j], viz:

H a [w] i l a	'he squinted'	S a [j] i d a	'he had a particular disease'
^{c} a [w] i z a	'he was wanting'	S a [w] i f a	'he was woolly'

s a [w] i d a 'he was black' ? a [w] i d a 'he was curved' (cf. Wright 1971:86-7)

While there are none of the above 'fa^{c}ila' forms in these Yemeni dialects - due, partially at least, to a general lack of the 'fa^{c}ila' pattern (cf. 4.1.1.3.), alternations such as those given above between a verb and its derivatives are common in Hubaiʃi, Gabiini and Kusmi. In Hubaiʃi, as will be observed below, while the vowel of the 'hollow' verb may be realised as [uu], [ii] or [aa] in the imperfect aspect, in the perfect aspect, the short vowel of consonant-initial inflectional forms is realised as [i] or [a] but never as [u], even in verbs where C_{ii} must be analysed as /w/ in a traditional framework (cf. 8.4.5.1.). All that can be done, in relating a verb and its various derivatives in these dialects, as in CA, is to provide what will obtain in default of any specific lexical rule. Since the Kusmi and Gabiini data are closer to those of Classical and Modern Standard Arabic, I shall consider these dialects first.

7.1.2. Kusmi and Gabiini:

In general, the short vowel of the stem in the perfect aspect of the hollow verb type has the same quality as the vowel of the imperfect stem in these dialects, viz:

Kusmi:

perf		imperf	
q [u] l k	'you m.s. said'	j u q [u u] l	'he says'
q [u] m k	'you m.s. got up'	j u q [u u] m	'he gets up'
s [i] r k	'you m.s. went'	j i s [i i] r	'he goes'
s [i] r [tʃ]	'you f.s. went'	t i s [i i] r	'she goes'
k [u] ^{c} k	'you m.s. looked for'	j u k [u u] ^{c}	'he looks for'

In the unmarked case, there is a direct correlation between the vowel of the shortened perfect stem, the vowel of the imperfect stem and of the verbal noun (prior to coalescence, cf. 7.2.2.1.1.). As in CA, however, this is not completely regular, as seen below:

perf		imperf		verbal noun	
x [u] f k	'you m.s. feared'	j i x [a a] f	'he fears'	x a [u] f	'fear'
n [i] m n a a	'we slept'	j i n [a a] m	'he sleeps'	n a [u] m	'sleep'

Gabiini:

Similarly, in Gabiini, the short vowel in the perfect aspect is either realised as [i] or as [u]. Apart from a few idiosyncratic lexical items, the correlation between the perfect stem vowel and the imperfect stem vowel is regular:

perf		imperf	
k [u] n k	'you m.s. were'	t u k [u u] n	'you m.s. are'
q [u] l ʃ	'you f.s. said'	j u q [u u] l	'he says'
s [i] r k	'I/you m.s. went'	j i s [i i] r	'he goes'
		(cf. Behnstedt 1985:138)	

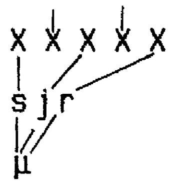
7.1.2.1. The verbal stem:

I shall establish the morphological template for the hollow verb in the perfect aspect in Kusmi and Gabiini as identical to the template for the sound triliteral verb, viz:

$$\mathrm{X}\ \overset{|}{\mathrm{X}}\ \mathrm{X}\ \overset{|}{\mathrm{X}}\ \mathrm{X} \quad \text{(cf. 4.3.)}$$

The consonantal melody for any hollow verb is, in general, given as that which obtains in the second binyan, if that is available, viz:

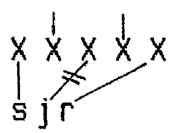
[n]a[ww]a[m] 'he made sleep', [x]a[ww]a[f] 'he made fear', [s]a[jj]a[r] 'he made go'. Consider derivatives of s-j-r 'to go':



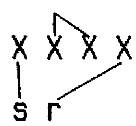
consonantal melody

Between two short vowels (where the left-most vowel is an NSV), the vocoid is deleted after association has taken place in accordance with the UACs (0.4.1.1.2.1.). I shall term this intervocalic vocoid deletion:

7.1.2.1.1. Intervocalic vocoid deletion:



When the subject pronoun is either nul or vowel-initial, as in the (third) inflectional forms, the resulting long vowel obtains, viz:

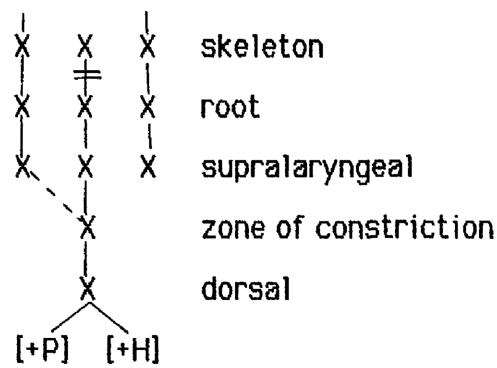


Following the application of redundancy rules, this form is realised as:

s a a r 'he went'

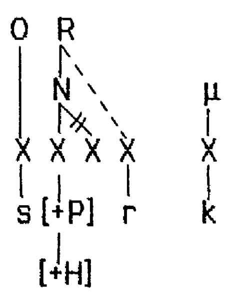
When the subject pronoun is consonant-initial, however, as in the case of the (first) and (second) inflectional forms, the zone of constriction node (whether [labial] - i.e. [+R] - or dorsal - i.e. [+P]) of the (deleted) vocoid spreads onto the supralaryngeal node of the left-most NSV, viz:

7.1.2.1.2. Intervocalic vocoid deletion and reassociation:



Note that intervocalic vocoid deletion and feature reassociation must take place in the lexical component since reassociation is dependent on morphological information - i.e. reassociation obtains when the inflectional form is (first) or (second), but does not obtain when the inflectional form is (third). Syllabification applies and, since unsyllabified elements remain, closed syllable construction (CSC) applies, viz:

7.1.2.1.3. Closed syllable construction:



(second)

The output, following tier conflation and the application of redundancy rules is: s [i] r k 'you m.s. went'

7.1.3. Hubaiʃi:

An account of the Hubaiʃi data is more problematic. As will be shown below, there is no predictable correlation between the vocoid of derived binyanim and of the first binyan verbal noun and the vowel of the short perfect stem, nor between the vowel of the imperfect stem and that of the short perfect stem, viz:

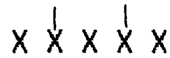
n [i] m k i	'you f. slept'	n a [w w] a m k	'you m. made sleep'
n a [u] m	'sleep'	j u n [u u] m	'he sleeps'
k [i] n k u m	'you pl. were'	k a [w w] a n k u m	'you pl. created'
k a [u] n	'being'	j u k [u u] n	'he is'
q [i] m k i	'you f. got up'	q a [w w] a m k i	'you f. woke'
q i [j] a a m	'getting up'	j u q [u u] m	'he gets up'
q [a] l k i	'you f. said'		
q a [u] l	'speech'	j u q [u u] l	'he says'

In general, the presence of [i] in the hollow verb in the perfect aspect denotes {intransitive} and the presence of [a] denotes {transitive} (cf. 5.1.). This is only what will obtain in the general case, however. While there are no instances of [a] being realised in the hollow stem of an {intransitive} verb, there are instances where [i] is realised in a {transitive} verb in the perfect aspect, eg:

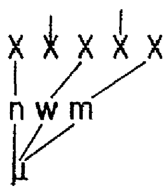
r [i] d n a a 'we wanted'

7.1.3.1. The verbal stem:

In order to capture the relationship between the first binyan and its derivatives, there are two options. Either, the morphological template for the first binyan of the hollow verb in the perfect aspect is that which is postulated for the sound triliteral verb, or a special template exists for this verb type. In neither case is it possible to account for all idiosyncratic behaviour of this verb type in Hubaiʃi. Consider what obtains when the morphological template is given as identical to that for the sound triliteral verb:



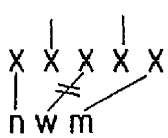
The consonantal melody is triliteral and is that which obtains in the second binyan, if available, as in the case of the Raimi dialects. The consonantal melody associates in accordance with the UACs (i.) (0.4.1.1.2.1.), viz:



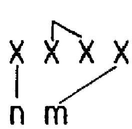
consonantal melody

As in Kusmi and Gabiini, the vocoid is subject to intervocalic deletion after association has taken place (cf. 7.1.2.1.1.), viz:

Intervocalic vocoid deletion:



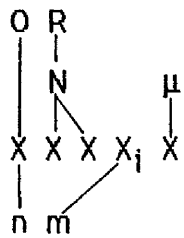
When the subject pronoun is nul or vowel-initial – i.e. when the inflectional form is [third] – the stem is realised with a long vowel, viz:



Following the application of redundancy rules, this is realised as:

n a a m 'he slept'

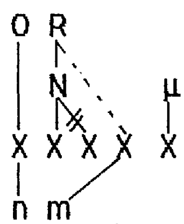
To the left of a consonant-initial subject pronoun, syllabification applies after the vocoid has been deleted in intervocalic position, viz:



[first]/[second]

Unsyllabified elements remain. In order to concur with the syllable template for the language, the long vowel is shortened by means of closed syllable construction (cf. 7.1.2.1.3.), viz:

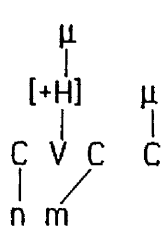
Closed syllable construction:



[first]/[second]

Note again that CSC must apply prior to tier conflation because, in this case, it is only after CSC that [+H], which is dependent on the morphological information [intrns], can associate with the rhyme-headed X slot. If [+H] association applied prior to CSC, then [third] inflectional forms of the hollow verb would be realised with a long [ii] (as opposed to [aa]). And if, on the other hand, [+H] applied after CSC, but CSC in turn applied after tier conflation, the <u>lexical</u> association of [+H] could not take place.

7.1.3.1.1. [Intrans] [+H] association:



[intr]

[first]/[second]

When the verb is [transitive], no vocalic melody is assigned.

The second possibility is that a different morphological template is posited for this verb type from that of the sound triliteral verb - namely, a template which is non-distinct from the template of the [third masculine singular] inflectional form, viz:

X X X X

The consonantal melody is triliteral. By stipulating that C_{iii} is preassociated with the right-most X slot of the template, C_{ii} (/w/ or /j/), is precluded from association, viz:

X X X X

C_i w/j C_{iii}

In accordance with Universal Association Conventions (0.4.1.1.2.1.) C_i associates with the left-most X slot; C_{ii} (/w/ or /j/) has no slot with which it can associate and, therefore, the vocoid of the consonantal melody is not realised. To arrive at the shortened stem, CSC occurs as diagrammed above (7.1.2.1.3.).

Both approaches provide the attested output and capture the relationship between the first binyan and its derivatives since the full consonantal melody is available for all derivatives. It is suggested by this, however, that the morphological template for the Hubaiʃi hollow verb in the perfect aspect should be identical to that for the sound triliteral verb. Differences between the [second] and [first] inflectional forms in the Raimi hollow verb and in the Hubaiʃi hollow verb depend on reassociation of the C_{ii} zone of constriction node in the Raimi dialects, while the quality of the short vowel in Hubaiʃi is determined, in the general case, not by the zone of constriction node of the medial vocoid, but rather by the transitivity of the verb.

A remaining problem in Hubaiʃi concerns the quality of the stem vowel of this verb type as realised in the {second masculine singular} inflectional form.

7.1.3.2. Vowel quality in the {second masculine singular} form:

In stem of the {second masculine singular} inflectional form the short vowel is realised as [a] regardless of the quality of this vowel in other {second} and {first} inflectional forms, viz:

<u>n a a m</u>

'to sleep'		<u>pl.</u>
1	n u m k	n i m n a a
2.m.	n [a] m k	n i m k u m
2f.	n i m k i	n i m k i n

<u>k a a n</u>

'to be'		<u>pl.</u>
1	k u n k	k i n n a a
2.m.	k [a] n k	k i n k u m
2f.	k i n k i	k i n k i n

Omiting the {first singular} inflectional form, which will be dealt with presently (cf. 8.4.5.1.), the short stem vowel of all {first} and {second} forms is realised as [i], except in the {second masculine singular} inflectional form. Looking at the same phenomenon (taking the paradigm of gaa^{C} 'to come') in the dialect of Gibla, Diem suggests:

> 'Die Form ga^{C}k ist eine analogische Neubildung, die sich folgendermaßen erklärt: die Differenzierung von u-a, wie sie beim starken Verbum in fa^{C}ulk - fa^{C}alk vorlag, wurde als kennzeichnend für den Unterschied 1 sg. - 2 msk. sg. aufgefaßt, so daß zu gu^{C}k, der die gleiche Vokal wie fa^{C}ulk aufwies, eine Form ga^{C}k mit einem a wie in fa^{C}alk gebildet werden konnte.' (Diem 1973:102)

However, the difference between [first singular] and [second masculine singular] could be expressed by means of the vowel [i] with equal validity, as in the hypothetical paradigm for 'to come':

g u ^{C} k 'I came' *g i ^{C} k 'you m.s. came' g i ^{C} k i 'you f.s. came'

The analogous neologism described by Diem accounts, not for the verb in which the short stem vowel is usually realised as [i], but rather for the verb in which the short stem vowel is usually realised as [a], viz:

q [u] l k 'I said' q [a] l k 'you m.s. said' q [a] l k i 'you f.s. said'

What I suggest is that [a] of the [second masculine singular] inflectional form in this verb type results from a lexical rule of [+H] disassociation which occurs when the inflectional form is [second masculine singular]:

7.1.3.2.1. [Second] [+H] disassociation:

```
 [+H]   μ      [second]
  ╪     |
C V C   C
```

The feature is disassociated and the NSV subsequently associates with the empty X slot. The NSV is realised by default as [a]. This is a rule which is clearly sensitive to morphological structure and must, therefore, apply in the lexical component prior to the operation of tier conflation. Further evidence for (second) [+H] disassociation in Hubaiʃi is observed in the third weak verb type in the imperfect aspect where a final [aa] marks the (second masculine singular) inflection and contrasts with final [ii] in all other inflections, viz:

? a ʃ t i i	'I want'	n i ʃ t i i	'we want'
t i ʃ t [a a]	'you m.s. want'	t i ʃ t i i	'you f.s. want'
? a ʃ t a r i i	'I buy'	n i ʃ t a r i i	'we buy'
t i ʃ t a r [a a]	'you m.s. buy'	t i ʃ t a r i i	'you f.s. buy'

Finally, two further non-sound verb types must be reviewed before I return to examine vowel distribution in the perfect aspect of the verb.

7.2. The third weak verb:

Consider, now, the verb type traditionally referred to as 'third weak', 'weak', 'defective' or 'tertiae infirmae' (Cowan 1958:125, Haywood and Nahmad 1962, Wright 1971, Diem 1973, Fischer and Jastrow 1980, Behnstedt 1985, 1987)[1]. Haywood and Nahmad say about this verb type in MSA and CA:

> 'The verb with weak final radical is called (المعتل) in Arabic, and, sometimes, in English, by the somewhat ambiguous term defective. The weak radical may be considered to have been originally either wāw or yā' . .' (Haywood and Nahmad 1962:235)

1. Ziadeh and Winder describe this verb type as the 'weak-lām' verb since the root radicals f-ᶜ-l are used traditionally in describing verbal patterns (Ziadeh and Winder 1958:66).

Note that in Hubaiʃi, Kusmi and Gabiini only one type of third weak verb is attested (as in Gibla, cf. Fischer and Jastrow 1980:73). In many other dialects spoken in North Yemen, two or three types exist. Behnstedt mentions a final -a type and a final -i type attested in the dialects spoken in the Sa^{c}da area (Behnstedt 1987:147); in San^{c}aani Rossi notes three types of third weak verbs - of the patterns raDhi 'to want', biki 'to cry' and ramee 'to throw' (Rossi 1939:34). In Egyptian Arabic, two types of third weak verb exist (Broselow 1976), and for Makkan Arabic, Bakalla provides underlying representations for two types of third weak verb, viz: |nisiy| 'he forgot' and |rajaw| 'he begged, asked (God, s.o.) (Bakalla 1979:161).

It will be maintained that inflection occurs in the same manner for this verb type as it has been shown to do for the sound triliteral and hollow verb types illustrated above. I shall examine the paradigm of r-Dh 'to want' or 'to desire', in Hubaiʃi, and ?-t 'to come' in the Raimi dialects.[1] The initial problem is basic. It concerns the representation of the verbal stem. Consider the following data for Hubaiʃi:

Hubaiʃi:

		pl.
1.	r a Dh o u k	r a Dh e i n a a
2.m.	r a Dh e i k	r a Dh e i k u m
2.f.	r a Dh e i k i	r a Dh e i k i n
3.f.	r a Dh a	r a Dh e i n
3.m.	r a Dh i	r a Dh u u/m

1. While r-Dh 'to want' is attested in the Raimi dialects and declines in the same way as ?-t 'to come' provided here, ?-t 'to come' is not attested in Hubaiʃi. In general, use of this verb appears to be restricted to dialects spoken in the Tihaami coastal plane (cf. Greenman 1979:60) and the mountain areas bordering on the coastal plane (cf. Behnstedt 1985:map104, 1987:48).

Now consider the data for Kusmi:

Kusmi:

		pl.
1.	?atoo[k^W]	?ateenaa
2.m.	?ateek	?ateekum
2.f.	?atee[tʃ]/[k_j]	?ateekun
3.f.	?atit	?ateen
3.m.	?ata	?atum

Gabiini is predictably similar to Kusmi.

Gabiini:

		pl.
1.	?ateek	?ateenaa
2.	?ateek	?ateekum
2.f.	?ateeʃ	?ateekun
3.f.	?atit	?ateen
3.m.	?ata	?atuu

In this case, unpredictable differences between the Raimi dialects (Kusmi and Gabiini) and Hubaiʃi are to be seen in the final vowel of the {third masculine singular} inflectional form – [i], in Hubaiʃi, and [a], in Kusmi and Gabiini – and in the Raimi realisation of {third feminine singular} – [it], where [at] is anticipated.

The verbal stem:

In previous instances, the uninflected form of the verb – i.e. the verbal stem – has been considered to be identical to the {third masculine singular] form. Discrepancies between the stem and the inflected forms subtracted from any subject pronoun (in the case of the hollow verb examined above) have been explicable in terms of syllable requirements. In this instance, a structuralist analysis of Hubaiʃi would recognise the existence of three allomorphs: these three allomorphs are posited as:

r a Dh i	the supposedly 'uninflected' [third masc. sg.]
r a Dh	before a vowel-initial subject pronoun
r a Dh e i	before a consonant-initial subject pronoun

A structuralist analysis of Kusmi and Gabiini would postulate another set of three allomorphs:

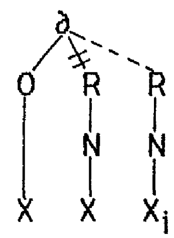
? a t a	the supposedly 'uninflected' [third masc. sg.]
? a t	before a vowel-initial subject pronoun
? a t e e	before a consonant-initial subject pronoun

7.2.1. Hubaiʃi:

I shall deal, in the first instance, with the Hubaiʃi data. Initially, I shall take the [third masculine singular] form as being homophonous with the verbal stem. I shall then demonstrate why this position is untenable and posit a different underlying representation for the stem of this verb type.

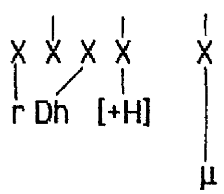
Taking raDhi as the uninflected stem for the verb 'to want', syllabification alone can account quite nicely for inflectional forms when the subject pronoun is vowel-initial: the negative condition on the juxtaposition of two vowels is resolved by means of R_i disassociation. When a vowel-final and a vowel-initial morpheme are concatenated, the unsyllabified vowel (X_i) triggers R_i disassociation (cf. 1.7.2.1. and 2.4.2.1.2.):

R_i disassociation:



If the verbal stem of this verb type were identical to the (third masculine singular) inflectional form, the (third feminine singular) form would be inflected as below:

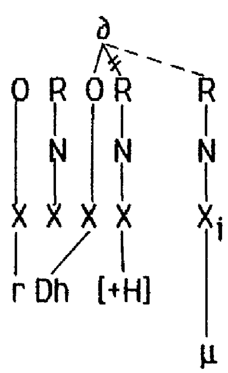
input:



(feminine)

Syllabification applies, and the unsyllabified vowel of the suffix triggers R_i disassociation, viz:

R_i disassociation:

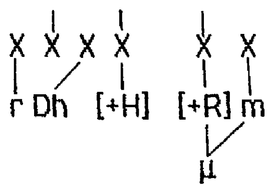


(feminine)

Following tier conflation and the application of redundancy rules, this provides the realisation: r a Dh [a] 'she wanted'

The unsyllabified vowel of (third masculine plural) and (feminine) forms similarly triggers R_i disassociation. The derivation of raDhum 'they m. wanted' would apply as below:

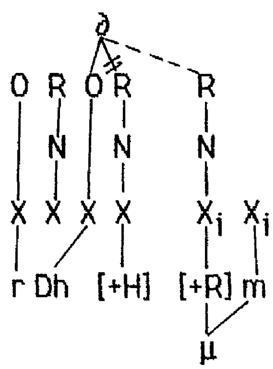
input:



(plural)

Syllabification takes place followed by R_i disassociation triggered by unsyllabified elements of the suffix, as below:

R_i disassociation:



(plural)

Following tier conflation and the application of redundancy rules, the realisation of this inflectional form would be:

r a Dh [u] m 'they m. desired'

It is not possible to maintain that the same, or that a similar, process is operative to derive raDhei from /raDhi/. Furthermore, in respect to syllabification, there is no reason why raDh[i]k should denote 'you m.s. desired/wanted' any less than the attested raDh[ei]k. The same argument is applicable to raDheiki, raDheinaa, raDheikum, and so on.

7.2.1.1. The verbal stem: 'enrichment' of the morphological template:

I suggest that the morphological template for the verbal stem of this verb type is not as posited above, rather, it is similar to that of the sound triliteral verb (cf. 4.3.), viz:

X X X X X

Where this template differs from that of the triliteral verb, however, is in 'enrichment' by the specification of [+P] to the right-most X slot on the template, viz:

X X X X X

[+P]

In contrast to CA and MSA (and Makkan Arabic - cf. Bakalla 1979:161), none of the three dialects investigated boast a third weak final 'w' type verb.

X X X X X

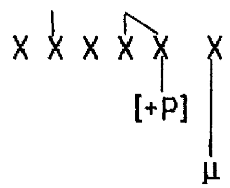
$C_i C_{ii}$ [+P]

Moreover, the consonantal melody is biliteral. The vocalic melody is never specified. A third weak verb type does not exist with a [+H] vocalic melody - in contrast to, say, Egyptian (Cairene) colloquial where n[i]si 'he forgot' is attested beside b[a]ki 'he cried' (Broselow 1976).

7.2.1.1.1. Consonant-initial suffixation:

The {first} and {second} inflectional forms are easily accounted for since these consonant-initial subject pronouns affix to the right of the verbal stem in the same way as they do in the sound triliteral verb type. As discussed in chapter two above (cf. 2.1.2.1.), the syllabicity of vocoids is dependent on their phonological environment. To the left of a consonant,

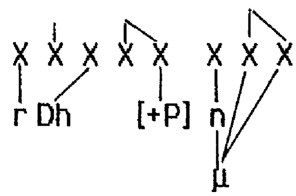
[+P] specified on the morphological template associates with a nuclear slot (and is realised as syllabic (cf. 2.1.)), viz:



(subject)

Consider the derivation of <u>raDheinaa</u> 'we wanted' in Hubaiʃi:

input:

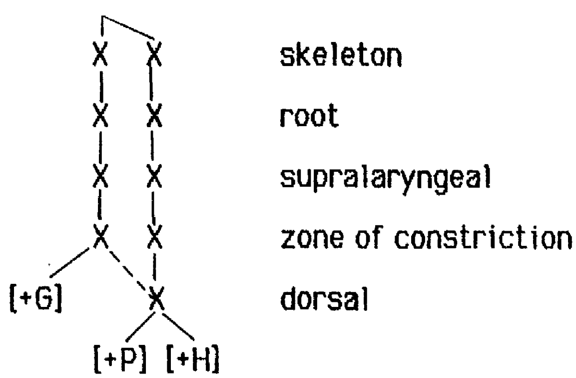


(first plural)

7.2.1.1.1.1. Palatal spread:

Underlying diphthongs are realised as [ai] and [au] in none of the dialects examined here. In Hubaiʃi, as mentioned above (cf. 2.2.), palatal spread occurs in the post-lexical component after the NSV has received specification for the default zone of constriction (i.e. D.R. [ ] ---> [+G]) spreading the dorsal node of the [+P] vowel onto the zone of constriction of the [+G] vowel (cf. 0.4.1.5.3.3.). This is diagrammed below, viz:

Palatal spread:



Following [+P] spread, the targeted vowel will be specified [+G,+P]. A review of the vocalic matrix illustrates that a vowel specified [+G,+P] is realised as [e] (the presence of [+G] renders [+H] non-distinctive in this instance):

	i	a	u	default realisations
H	+		+	
R			+	
G		+		
P	+	+		
		[e]		realisational value (cf. 2.3.1.)

The final output is the attested:

r a Dh [e i] n a a 'we wanted'

The same process applies to derive raDheiki 'you f.s. wanted', raDheik 'you m.s. wanted', raDheikum 'you m.pl. wanted' and raDheikin 'you f.pl. wanted'. (cf. 8.4.5.2., for raDhouk 'I wanted'.)

7.2.1.1.1.2. The shortened variants:

When any of the {first} or {second} forms occur to the left of a consonant-initial object pronoun, or to the left of the /ʃ/ negative suffix, rhyme shortening occurs in the stem and the pre-suffixal rhyme is realised as [a]. The following forms are attested:

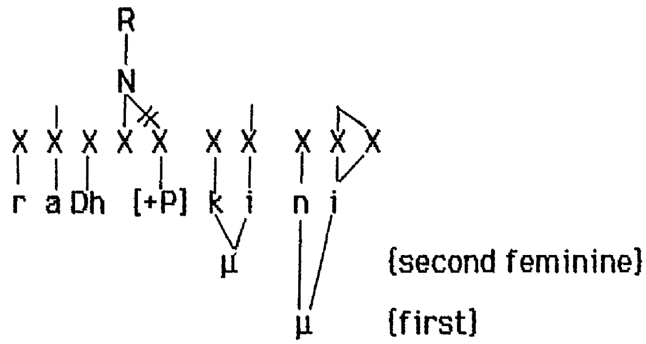
/r a Dh a i k i + n i i/ --> r a Dh [a] k i i n i i 'you f. wanted me'

/m a a + r a Dh a i k + ʃ/ --> m a a r a Dh [a] k ʃ 'you m. didn't want'

/m a a + r a Dh a i k i + ʃ/ --> m a a r a Dh [a] k i i ʃ 'you f. didn't want'

The process is formalised as below in the derivation of raDhakiinii 'you f.s wanted me':

7.2.1.1.1.2.1. Rhyme shortening:



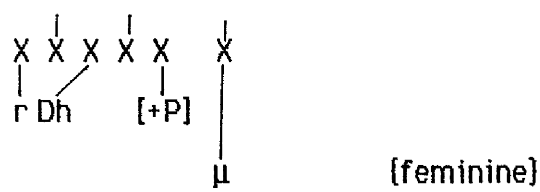
[+P] does not reassociate. The vowel of the penultimate suffix is then lengthened (cf. 6.1.1.4.1.) and following the operation of redundancy rules, the output is as below:

r a Dh [a] k i i n i i 'you f.s. wanted me'

7.2.1.1.2. Vowel-initial suffixation:

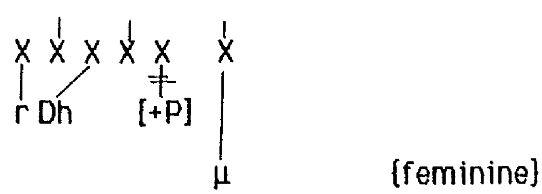
The form of the verbal stem realised to the left of a vowel-initial subject pronoun is derived by means of processes already established in the phonology. Consider the derivation of raDha 'she wanted':

input:

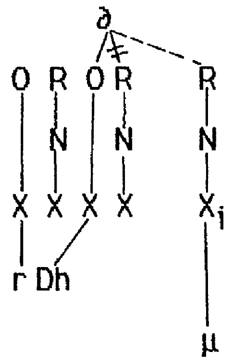


As noted above, a single vocoid is generally unattested in intervocalic position to the right of an NSV in all three dialects (cf. 7.1.2.1.). The vocoid is deleted in this position and R_i disassociation is triggered by the resulting unsyllabified vowel.

Intervocalic vocoid deletion:



R_i disassociation:

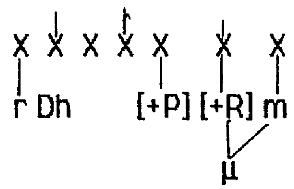


(feminine)

The output, following tier conflation and the application of redundancy rules, is: r a Dh a 'she wanted'

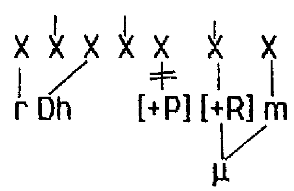
The plural forms are derived in precisely the same manner. Consider the derivation of <u>raDhum</u> 'they m. wanted':

input:



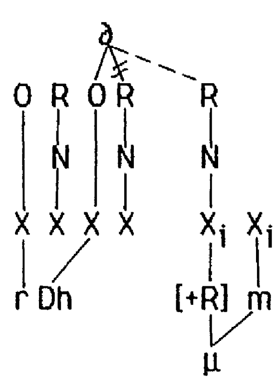
(plural)

Intervocalic vocoid deletion:



(plural)

R_i disassociation:



(plural)

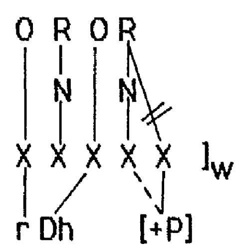
The output, following tier conflation and the application of redundancy rules, is:

r a Dh u m	'they m. wanted'

7.2.1.1.3. (Third masculine singular):

In the case of the (third masculine singular) inflectional form, the final vocoid of the verbal stem is not realised in any position. It appears that historically the vocoid was disassociated post-vocalically in phonological word-final position, and [+P] reassociated with the adjacent NSV, viz:

Final vocoid disassociation and reassociation:



The form was realised, as today, as:

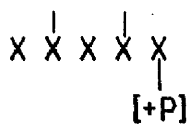
r a Dh i	'he wanted'

The final vowel of the resulting form, raDh[i] has remained for this third weak verb type specifically. It is hypothesised that final vocoid disassociation occurred historically in phonological word-final position and has since been generalised to other phonological positions - i.e. final vocoid disassociation has since entered the lexicon, since the (third masculine singular) inflectional form is never realised with a final non-syllabic vocoid today, viz:

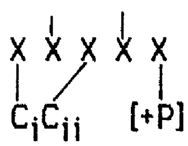
r a Dh [i]	'he wanted'
r a Dh [i i] n i i	'he wanted me'
m a a r a Dh [i i] ʃ	'he didn't want'
m a a r a Dh [i] n i i ʃ	'he didn't want me'

7.2.2. Kusmi and Gabiini:

In Kusmi and Gabiini, the morphological template for the third weak verb is 'enriched', as in Hubaiʃi, by the specification of [+P] to the final X slot, viz:



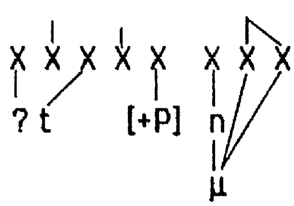
The consonantal melody is biliteral and there is no specified vocalic melody. The verbal stem is posited as below:



7.2.2.1. Consonant-initial suffixation:

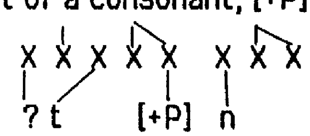
As in Hubaiʃi, the realisation of the third weak verbal stem to the left of the consonant-initial subject pronouns in the Raimi dialects is predictable. The subject pronoun suffixes onto the verbal stem. Consider the derivation of <u>?ateenaa</u> 'we came':

input:



(first plural)

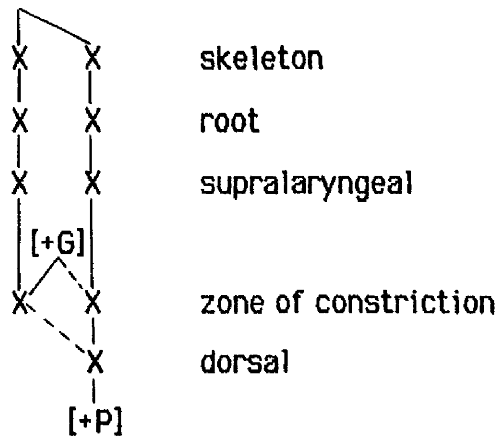
To the left of a consonant, [+P] associates with a nuclear slot, viz:



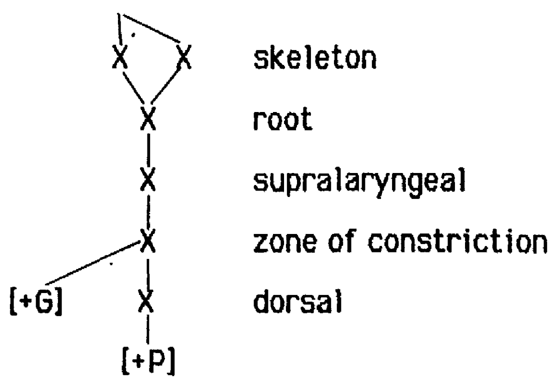
7.2.2.1.1. Monophthongisation:

As mentioned above (7.2.1.1.1.1.), the diphthongs [au] and [ai] are realised as such in none of the three dialects under consideration. In the Raimi dialects, the underlying diphthong is subject to monophthongisation. This is formalised as coalescence which applies in the post-lexical component after the NSV has been specified for the default zone of constriction ([+G]) (and cf. 0.4.1.5.3.2.), viz:

Coalescence:



The dorsal node spreads leftwards onto the zone of constriction of the [+G] vowel, just as the [guttural] node spreads rightwards onto the zone of constriction of [+P] vowel. The OCP subsequently brings about simplification to:



[+G,+P] vowels are realised as [e] in the Raimi dialects, as they are in Hubaiʃi, above (7.2.1.1.1.1. and cf. 2.3.1.). The realised output is:

? a t [e e] n a a 'we came'

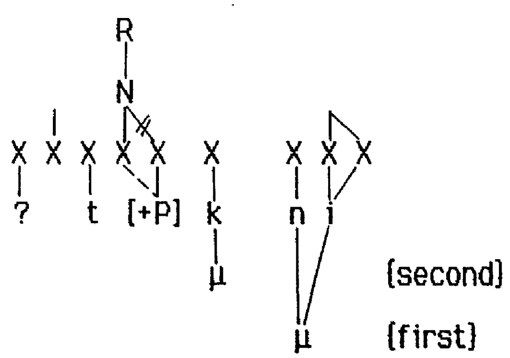
7.2.2.1.2. The shortened variants:

As was observed in Hubaiʃi, when a consonant-initial subject pronoun is bounded by a consonant-initial object pronoun, or by the negative suffix, /ʃ/, the diphthong of the verbal stem is shortened by means of rhyme shortening. The following forms are attested:

/m a a + ? a t a i k + ʃ/	-->	m a t [i] k ʃ	'you m. didn't come'[1].
/m a a + ? a t a i n a a + ʃ/	-->	m a t [i] n a a ʃ	'we didn't come'
/? a t a i k + n i i/	-->	? a t [i] k n i i	'you m. came to me'

Note in these dialects that the resultant short vowel is realised, not as [a], nor as [e], but as [i]. [a] would be the expected realisation were it the case that [+P] did not reassociate, as in Hubaiʃi above, and [e] would have been the expected realisation had coalescence applied prior to rhyme shortening. In this instance, [+P] reassociates leftwards onto the NSV (as it does in the case of the hollow verb, cf. 7.1.2.1.2.). The process is diagrammed below:

Rhyme shortening and reassociation:



This is realised, following the operation of redundancy rules, as:

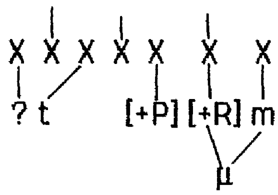
? a t [i] k n i i 'you m. came to me'

1. And after laryngeal disassociation, cf. 3.1.2.3.1.

7.2.2.2. Vowel-initial suffixation:

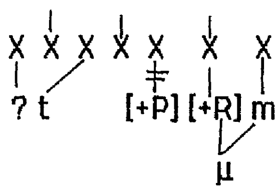
In the case of suffixation of vowel-initial subject pronouns, the negative condition regarding non-geminate intervocalic vocoids is resolved by means of vocoid deletion. This is followed naturally by R_i disassociation. Consider the derivation of Kusmi ?atum 'they m. came':

input:



(plural)

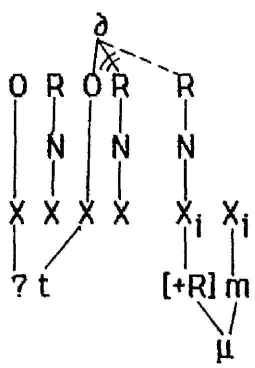
Intervocalic vocoid deletion:



(plural)

The resulting unsyllabified vowel of the suffix triggers R_i disassociation:

R_i disassociation:



(plural)

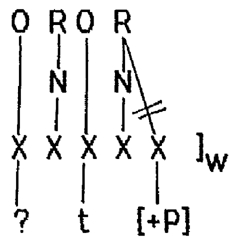
The output, following the application of redundancy rules, is realised as:

? a t u m 'they m. came'

7.2.2.3. {Third masculine singular}:

It is maintained that the {third masculine singular} inflectional form was derived by historical disassociation of a final vocoid in response to a negative condition on post-vocalic vocoids in phonological word-final position. In contrast to Hubaiʃi, however, [+P] associated with the vocoid falls away and does not reassociate with the contiguous vowel.

Word-final vocoid disassociation:



As in Hubaiʃi, a final non-syllabic vocoid variant of the {third masculine singular} inflectional form is never realised today. For Kusmi and Gabiini, it is suggested that final vocoid disassociation occurred historically in phonological word-final position and has since been generalised to all morphological and phonological positions - i.e. it has since entered the lexicon.

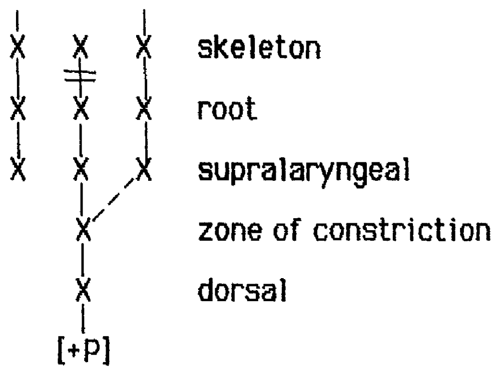
7.2.2.4. {Third feminine singular}:

While {third feminine singular} falls under the category of vowel-initial suffixation in Kusmi and Gabiini as in Hubaiʃi, it does appear to pose problems here. The problem concerns the quality of the suffixal vowel which, as [i], is at odds with the NSV (realised as [a]) of the {third feminine singular} subject pronoun in the triliteral and the hollow verb types. The form is realised as:

? a t [i] t 'she came'

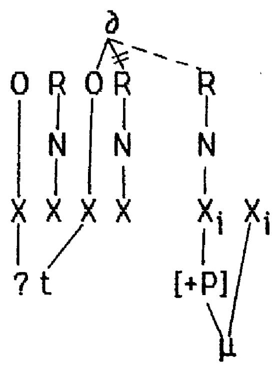
In this case, vocoid deletion occurs to the left of a vowel-initial subject pronoun as it does in the case of <u>?atum</u> 'they m. came'. The zone of constriction node associated with the (deleted) vocoid in this case, however, reassociates rightwards with the NSV (cf. 7.1.2.1.2.):

Intervocalic vocoid deletion and reassociation:



Syllabification takes place and R_i disassociation is triggered by the unsyllabified vowel (X_i), viz:

R_i disassociation:



(feminine)

Following tier conflation and the operation of redundancy rules the (third feminine singular) inflectional form is realised as:

?atit 'she came'

The derivation of the (third feminine singular) inflectional form suggests that either reassociation of [+P] is restricted to this morpheme, or that a specific condition prevents the reassociation of [+P] with the final vowel of [third masculine singular] in these dialects. In view of the fact that [+P] does reassociate when rhyme shortening occurs in the suffixed variants given above, such as ?at[i]knii 'you m.s. came to me' (in contrast to Hubaiʃi), and since there is a general constraint on the occurrence of short marked vowels (i.e. [i] or [u]) in phonological word-final position (cf. chapters two and eight), it is suggested here that the latter proposal has more validity.

7.2.3. Hubaiʃi [third feminine singular] + object pronoun:

By positing the form /$C_i aC_{ii} a$[+P]/ as the uninflected stem of the third weak verb, the mechanism has been established by which to deal with the [third feminine singular] inflectional form to the left of an object pronoun in the perfect aspect of this verb type. Consider the data:

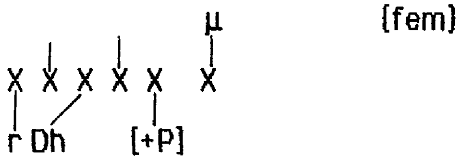
r a Dh a	'she desired'
r a Dh e i t u	'she desired him/it'

7.2.3.1. Analogy:

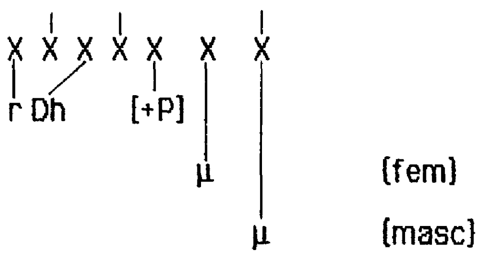
For dialects spoken by inhabitants of Ta^{c}izz, Diem observes this allomorphy. He explains it on the basis of analogy: the [third feminine singular] inflectional form plus object pronoun parallels the forms of [first] and [second] persons: for when [first] and [second] inflectional forms are realised as -eik..., then so is the [third feminine singular] inflectional form realised as -eit and for no other reason than that [first] and [second] forms are realised as -eik (cf. Diem 1973:313). The argument is circular. Analogy, while it does, indeed, play a vital role in language and, particularly, in language change, does, all too frequently, appear to be the waste bin of all that is found difficult to explain. It does not help to solve this particular dilemma.

An explanation is readily available. The stem of this verb for Hubaiʃi is posited, not as */raDh/ but rather as /raDha[+P]/. The unassociated X slot of the {feminine} subject pronoun is suffixed to the verbal stem, as below:

input:

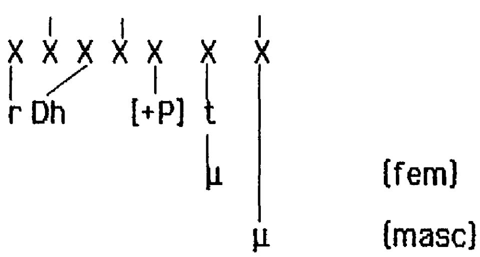


To the left of an object pronoun, no rhyme-head is attached to the X slot of the {feminine} representation, viz:

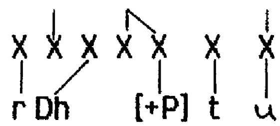


The lexical NSC associates with the X slot and the final lexical redundancy rule then specifies the default zone of constriction for the NSC as [+coronal], viz:

L.D.R. [ ] ---> [+Cl] (cf. 5.8.2.)



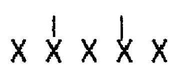
To the left of a consonant the [+P] feature associates with a nuclear slot, viz:



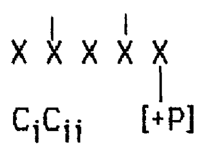
Redundancy rules supply remaining feature-values. Palatal spread applies from the [+P] vowel to the adjacent NSV at a late stage in the derivation - i.e. after [+G] has been supplied to the NSV - to produce the attested output:

r a Dh e i t u 'she wanted him'

In Kusmi, Gabiini and Hubaiji, the morphological template of the third weak verb type has the same basic shape as that of the sound triliteral verb type, viz:



However, this template differs from that of the sound triliteral verb in that the morphological template has some 'enrichment' - i.e. [+P] is specified on the final X slot of the template - and the consonantal melody is biliteral, viz:



In contrast to other modern dialects of Arabic - including other dialects spoken in North Yemen - all three dialects investigated boast one type of third weak verb and the vocalic melody is never specified.

Dialect variation for this verb type is seen in the nature of suffixation and the operation of [+P] reassociation. In Gabiini and Kusmi, [+P] does not reassociate from the final disassociated vocoid onto the NSV of (third masculine singular), and so the (third masculine singular) inflectional form is realised in all positions with a final [a] (or [aa] before an ultimate suffix). In Hubaiʃi, [+P] does reassociate from the final disassociated vocoid in the (third masculine singular) inflectional form; this form is now realised in all positions with a final [i] (or [ii] before an ultimate suffix). In all three dialects, rhyme shortening before a penultimate suffix (when the ultimate suffix is consonant-initial) takes place; in Gabiini and Kusmi, [+P] reassociates with the NSV following rhyme shortening to produce, for example, <u>?at[i]knii</u> 'you m.s. came to me'; in Hubaiʃi, reassociation does not take place and the short vowel is realised by default as [a], as in, <u>raDh[a]knii</u> 'you m.s. wanted me'.

7.3. The doubled verb:

In this chapter I shall finally consider what has been referred to as the 'doubled' verb. This verb type has been referred to traditionally as doubled owing to gemination of the second radical consonant in the [plural], [second] and [first] inflectional forms and in the non-utterance-final realisation of [third masculine singular] in both the perfect and imperfect aspects. I shall present the data in the same order as for the third weak verb - Hubaiʃi, Kusmi, Gabiini. Since all variation manifested between the dialects for this verb type is not peculiar to the doubled verb and has been handled above (except for vowel quality in the verbal stem for the [first singular] inflectional form, which will be dealt with in detail in chapter eight), I shall discuss the three dialects together. I shall establish the verbal stem and then examine the verb as it is manifested to the left of consonant-initial subject pronouns. It has frequently been claimed that [first] and [second] person inflectional forms of the doubled verb are created as a result of analogical levelling with the third weak verb. In this section, I agree with the analogy argument but advance with the analysis, attempting to explain just why this verb type has been constructed on analogy with the third weak verb. Finally, the analysis as given below explains not only the pre-consonantal [ee] and [ei] realisations, but also provides insight into the derivations of the [third feminine singular] inflectional forms in all three dialects. The paradigm taken in the first instance is of <u>Habb</u> 'to love'. Data with forms in phonological word-final position will be presented:

Hubaiʃi:

		<u>pl.</u>
1.	H a b b o u k	H a b b e i n a a
2.m.	H a b b e i k	H a b b e i k u m
2.f.	H a b b e i k i	H a b b e i k i n

3.f.	H a b b a	H a b b e i n
3.m.	H a b	H a b b u m

Kusmi:

		pl.
1.	H a b b o o [k^W]	H a b b e e n a a
2.m.	H a b b e e k	H a b b e e k u m
2.f.	H a b b e e [tʃ]/[k_j]	H a b b e e k u n
3.f.	H a b b i t	H a b b e e n
3.m.	H a b	H a b b u m

Gabiini:

		pl.
1.	H a b b e e k	H a b b e e n a a
2.m.	H a b b e e k	H a b b e e k u m
2.f.	H a b b e e ʃ	H a b b e e k u n
3.f.	H a b b i t	H a b b e e n
3.m.	H a b	H a b b u u

7.3.1. Vocalism:

In all cases, the stem vowel of this verb type, as with the stem vowel of the third weak biliteral verb type viewed above, is the NSV in the perfect aspect. In the imperfect aspect, the vowel is generally marked underlyingly and may be realised as [i], as in:

j i H [i] b 'he loves'

or as [u], as in:

j i / j u b [u] z 'he carries'

j i / j u ʃ [u] x 'he pisses'

7.3.2. The verbal stem:

The initial problem lies in establishment of the verbal stem. Note this verb type has been referred to as biliteral, in addition to 'doubled' in many modern Arabic dialects because the [third masculine singular] form boasts a non-geminate final consonant in utterance-final position (cf. Broselow 1976:157). In the Yemeni dialects examined here, the following utterance-final forms are attested for [third masculine singular]:

H a b]$_{\varphi}$	'he loved'
ʃ a x]$_{\varphi}$	'he pissed'
b a z]$_{\varphi}$	'he carried'
ʃ a n]$_{\varphi}$	'he seived'

7.3.2.1. Utterance-final degemination:

Given the fact that all final geminates are subject to utterance-final degemination, not only in these Yemeni dialects (cf. 1.3.1.1.1.), but also in most, if not all other recorded modern dialects of Arabic (Jastrow 1984, Broselow 1976:157, etc.). Note:

k u [l l] a l b a n a a w i t	'all the girls'
(? a) l k u [l]]$_{\varphi}$	'everything'
H u [b b] a l w a a l i d	'love of the father'
H u [b]]$_{\varphi}$	'love'

And given the facts of word stress assignment (cf. 1.4.3.): word stress is assigned to the final syllables of <u>jubuz</u>]$_{\varphi}$ and <u>jiHib</u>]$_{\varphi}$ as if the latter syllables contained a superheavy rhyme, viz:

j i 'H i b]$_{\varphi}$ 'he loves' as opposed to *'j i H i b] $_{\varphi}$

Given the surface form, this latter starred instance would be the realisation the canons of word stress assignment for these dialects would predict. Compare word stress assignment in the triliteral verb:

'ʃ i m i h	'he saw'
ʃ i 'm i h k	'you m.s. saw'
'r a S a d	'he wrote'
r a 'S a d k	'you m.s. wrote'
'j i g l i s	'he sits'
j i 's i i r	'he goes'

In chapter one it is seen that stress is assigned finally if and only if the rhyme of the final syllable comprises three elements. If not, then stress is assigned to the right-most non-final heavy (CVC) syllable, or to the first syllable or the antepenultimate syllable (whichever is right-most) if there is no heavy syllable in the phonological word (cf. 1.4.3.2.).

As observed in chapter one, utterance-final degemination does apply and it necessarily applies following, and not prior to, the assignment of stress. The following negative condition is postulated, viz:

$$* \; X \; X \;]_{\varphi} \quad [F^n] \qquad \text{(where } [F^n] = \text{all features)}$$

The repair process invoked disassociates [F^n] from the second 'X' slot when the geminate occurs in utterance-final position (cf. 1.3.1.1.1.).

7.3.2.1.1. The verbal stem of the doubled verb type is therefore given as a biliteral consonantal melody being mapped onto a template of the shape:

$$X \; \overset{|}{X} \; X \; X$$

The morphological template of this verb type differs from that of the third weak, hollow and sound triliteral verb types in that it comprises four timing slots and only a single rhyme-headed slot. In common with the third weak verb type, the doubled verb has a biliteral consonantal root. In contrast to the third weak verb, the second consonant, C_{ii}, of this verb type spreads freely onto the final X slot of the template since the template is not 'enriched' by the prior association of [+P].

7.3.2.2. Consonant-initial suffixation:

Although the non-inflected stem has been determined, it is not yet possible to label discrete morphemic tiers. How are the vocalic sequences which appear to the left of the consonant-initial subject pronouns to be dealt with? If the stem of the verb type is CVCC, then any vocalic sequences to the right of the stem are either part of the suffix, or are inserted by rule. If it were claimed that any sequence to the right of the verbal stem is suffixal material, it would be necessary to claim that the subject pronouns for this verb type differ from those for all other verb types. This position would be both ad hoc and costly.

7.3.3. Resemblances with the third weak verb type:

Firstly, it will be appreciated that the inflected forms of the doubled verb bear a strong resemblance to those of the third weak verb. Consideration of the consonant-initial inflectional forms of this verb type pushes the parallel further. The short forms are given below the lengthened or non-reduced forms:

	Hub.	Kus./Gab.
doubled		
'you m.s. felt'	H a s s [e i] k	H a s s [e e] k

'you m.s. felt me'	H a s s [a] k n i i	H a s s [i] k n i i

<u>third weak</u>

'you m.s. wanted'	r a Dh [e i] k	r a Dh [e e] k
'you m.s. wanted me'	r a Dh [a] k n i i	r a Dh [i] k n i i

The data, as presented above, suggest that the vocalic sequences to the right of the stem in this verb type are no more intrinsic components of the suffixes than they are in the case of the third weak verb. And, while surface data make it appear that the same process is initiated in the two verb types, this cannot be the case - for <u>raDhi</u> and <u>?ata</u> forms boast an 'enriched' morphological template of the shape:

```
  |   |
X X X X X
        |
       [+P]
```

While the underlying template for the doubled verb is given as:

```
  |
X X X X
```
[1].

7.3.3.1. The role of analogy:

This problem is most certainly not peculiar to Yemeni Arabic: for the dialects spoken in Mardin, Malta, Tunis-Muslim, Algiers-Jewish (Jastrow and Fischer 1980:69) in addition to Damascene and Cairene Arabic, (Broselow 1976; McCarthy 1986:246) the form for 'I loved' is <u>Habbeet</u>. While the data are well-documented, any linguistic explanations have been drawn perhaps exclusively on the basis of analogical levelling with the

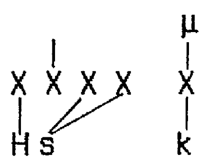
1. In the dialect of an-NaDhiir in the North of the country the distinction between doubled and form II (medial geminate) third weak verbs has collapsed entirely (cf. Behnstedt 1987:145).

postulation of more or less ad hoc rules of allomorphy (Broselow 1976, Diem 1973, McCarthy 1986:247). McCarthy suggests an early allomorphy rule (+ee), and states:

> 'this linking vowel is generally taken to be the result of analogy with verbs whose third root consonant was y like rameet.' (McCarthy 1986:246-7)

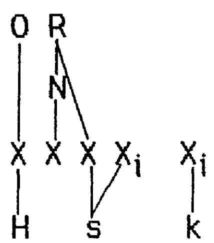
7.3.3.2. Consider one attempted derivation of Hasseik 'you m.s. felt' in Hubaiʃi:

input:



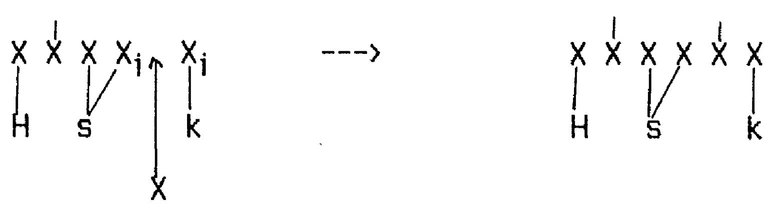
[second masc]

Syllabification:



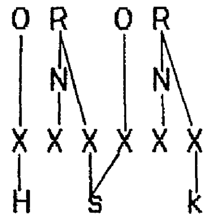
A sequence of three consonants is impermissible in any phonological position. Syllabification applies as above and the resulting unsyllabified consonants prompt epenthesis: a rhyme-headed X slot is inserted as below:

Epenthesis:



Syllabification proceeds as below:

Syllabification:



Remaining redundancy rules would then operate to create the following unattested output:

*H a s s [a] k

And this does not concur with the attested:

H a s s [e i] k 'you m.s. felt'

Phonologically, the form derived from this process is perfectly in order; *Hass[a]k is fully syllabified: and since no syllable constituent boasts in excess of two elements, it is arguable that the unattested *Hass[a]k is closer to optimal syllabification than the attested Hass[ei]k 'you m.s. felt'.

How are Hass[ei]k and Hass[ee]k 'you m.s. felt' derived in the three dialects?

Firstly, the resemblances between the third weak verb type and the doubled verb cannot be forgotten. Consider the shortened variants of the consonant-initial inflectional forms of the doubled verb as they occur to the left of a consonant-initial object pronoun or the negative suffix, /ʃ/:

H a s s [a] k n i i 'you m.s. felt me' (Hub.)

and:

H a s s [i] k n i i 'you m.s. felt me' (Kus./Gab.)

These forms, as seen above (cf. 7.3.3.), parallel forms of the third weak verb, viz:

r a Dh [a] k n i i	'you m.s. wanted me'	(Hub.)

and

? a t [i] k n i i	'you m.s. came to me'	(Kus./Gab.)

And consider the realisation of the (third feminine singular) inflectional form in Kusmi and Gabiini:

H a b b [i] t	'she loved'
H a s s [i] t	'she felt'

These forms also parallel the third weak forms:

r a Dh [i] t	'she wanted'
? a t [i] t	'she came'

Any analysis of the doubled verb must be able to recognise the identity of the pattern.

7.3.3.3. An alternative analysis:

It is suggested that that which non-derived biliteral verb types hold in common is not only the fact that the consonantal melody of these verb types is biliteral as opposed to triliteral, but also, the presence of a [+P] feature which is part of the template in the case of the third weak verb and is unplaced (or floating) in the case of the doubled verb. With the exception of the (third masculine singular) perfect form of the third weak verb in Hubaiʃi (which is handled above, cf. 7.2.1.1.3.), and the (third feminine singular) perfect forms of the doubled and the third weak verbs in Kusmi and Gabiini, this [+P] feature is restricted in its manifestation to consonant-initial inflectional forms. The stem of the doubled verb type is therefore given as in 7.3.2.1.1. above, but with a final unplaced [+P] feature.

7.3.3.3.1. An explanation at the lexical level:

If the verbal data presented so far are reconsidered, in all instances, it is seen that the bare nucleus of the rhyme does not occur in the position:

```
*R
 |
 N   μ
 |   |
 X   Xi ]W
```

Consider the pre-suffixal rhyme (underlined) in the following examples:

	Hub.	Kus./Gab.
'you m.s. wrote'	r a S a d + k	r a S a d + k
'you m.s. said'	q a l + k	q u l + k
'you m.s. wanted'	r a Dh e i + k	r a Dh e e + k
'you m.s. loved'	H a b b e i + k	H a b b e e + k
'she said'	q a a l + a	q a a l + a t

No subject pronoun, consonant-initial or vowel-initial, is suffixed directly to the non-branching nucleus of a non-branching rhyme. The negative condition is represented formally as below:

```
*R
 |
 N   μ
 |   |
 X   X
```

And is stated as:

7.3.3.3.1.1.

> 'in the perfect aspect of the verb no non-branching nucleus occurs to the immediate left of an inflectional suffix, 'X''

When a consonant-initial object pronoun is suffixed to a consonant-initial subject pronoun in the perfect aspect of a third weak or doubled verb, a short vowel is realised to the immediate left of the subject pronoun, viz:

	Hub.	Kus./Gab.
'you m.s. wanted me'	r a Dh [a] k + n i i	r a Dh [i] k + n i i
'you m.s. loved me'	H a b b [a] k + n i i	H a b b [i] k + n i i

Similarly, when the negative suffix is affixed to the right of a vowel-final object pronoun the pre-consonantal rhyme comprises a durationally short vowel - i.e. a non-branching nucleus, viz:

'you m.s. didn't want him'	m a a r a Dh [a] k u u +ʃ	(Hub.)
'you m.s. didn't want him'	m a a r a Dh [i] k u u +ʃ	(Kus./Gab.)

The negative condition is revised accordingly as:

7.3.3.3.1.2.

> 'in the perfect aspect of the verb no non-branching nucleus occurs to the immediate left of a phonological word-final inflectional suffix.'

It is also noticed that the rhyme to the immediate left of a consonant-initial subject pronoun comprises two elements when a vowel-initial object pronoun is suffixed as long as this latter is not directly followed by a negative suffix, viz:

	Hub.	Kus./Gab.
'you m.s. loved him'	H a b b [e i] k + u	H a b b [e e] k + u h
'you m.s. wanted him'	r a Dh [e i] k + u	r a Dh [e e] k + u h

The positive condition is expressed as below following this further revision:

7.3.3.3.1.3.

> 'in the perfect aspect of the verb the rhyme to the immediate left of X + Y - where X is a consonant-initial inflectional suffix and Y is nothing or a vowel - comprises two and only two elements at the level of zero-projection.'

7.3.3.3.2. Lexical epenthesis:

There are two processes available to preserve structure should the rhyme of the verbal stem not concur with condition 7.3.3.3.1.3.. In case a vowel-final morpheme precedes a vowel-initial morpheme, the vowel of the left-most morpheme is subject to deletion, by means of R_i disassociation (cf. 1.7.2.1. and 2.4.2.1.2.). In case a geminate consonant occurs in verbal stem-final position and immediately precedes a consonant-initial subject pronoun, epenthesis is triggered by the unsyllabified consonants. In order to provide an output which is both syllabified, and concurs with condition 7.3.3.3.1.3., it is suggested here that two X slots are epenthesised to the right of the geminate verbal stem before a consonant-initial subject pronoun. As a result of analogical levelling with the third weak verb type, an unplaced [+P] feature is generally available and associates with the right-most epenthesised X slot (and cf. 1.4.4.1.). This is clearly a lexical process: not only does lexical [+R] spread from {first singular} affect the epenthesised elements in Kusmi and Hubaiʃi (cf. 8.3.6.3.1.), but also, the output of other instances of epenthesis does not concur with condition 7.3.3.3.1.3.; for example, when the (first singular) object pronoun is suffixed to the (third masculine singular) inflectional form of the doubled verb, eg.

/H a b b + n i i/ ---> H a b b [a] n i i 'he loved me'

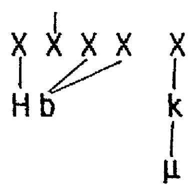
And when the negative suffix, /ʃ/ is affixed to a (second masuline singular) inflectional form in the perfect aspect, eg.

/m a a + ʃ i m i h k + ʃ/ --> m a a ʃ i m i h k [a] ʃ 'you m.s. didn't see'

Consider the application of lexical epenthesis:

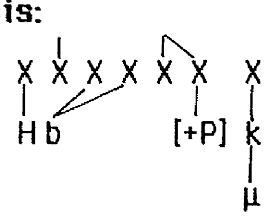
Lexical epenthesis:

input:



(second masc)

Epenthesis:



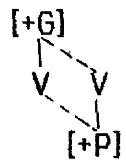
(second masc)

The output of epenthesis now concurs with condition 7.3.3.3.1.3.

7.3.3.3.2.1. Coalescence:

In none of the three dialects does /ai/ surface as [ai] (cf. 7.2.2.1.1. and 7.2.1.1.1.1.). In Kusmi and Gabiini coalescence occurs at a low level in the derivation after the default zone of constriction ([+G]) has been assigned to the NSV. This process is expressed informally below for convenience:

Coalescence:



The left-most vowel adopts the dorsal node from the adjacent vowel, while the [guttural] node, [+G], spreads from left-to-right onto the right-most vowel This sequence is now realised as:

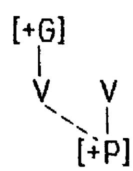
/a i/ --> [e e] (cf. 7.2.2.1.1.)

Following the operation of remaining redundancy rules, this provides the attested output:

H a b b [e e] k 'you m.s. loved'

7.3.3.3.2.2. Palatal spread:

In Hubaiʃi, the dorsal node spreads from right-to-left onto the NSV after the default zone of constriction ([+G]) for the NSV has been assigned (cf. 7.2.1.1.1.1.). In contrast to Gabiini and Kusmi, [+G] does not spread from left-to-right onto the zone of constriction of the [+P] vowel. The process is expressed informally below, viz:



[+P,+G] is realised as [e] (cf. 2.3.1.), and the sequence is now realised as:

/a i/ --> [e i] (cf. 7.2.1.1.1.1.)

Following the operation of remaining redundancy rules, this provides the attested output:

H a b b [e i] k 'you m.s.loved'

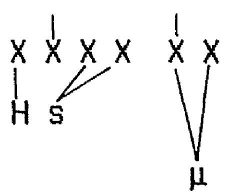
7.3.4. [Feminine] in the doubled verb:

The analysis, as it has been revised, not only serves to formally capture similarities between the third weak verb and the doubled verb types, but also elucidates the [third feminine singular] inflectional forms in the dialects, viz:

H a s s [i] t	'she felt'	(Kus./Gab.)
H a s s [a]	'she felt'	(Hub.)
H a s s [e i] t u	'she felt it/him'	(Hub.)

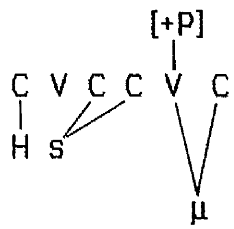
7.3.4.1. Kusmi and Gabiini:

In the case of the Raimi dialects, the input is:



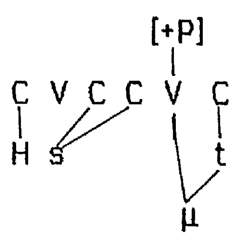
[feminine]

The unplaced [+P] feature docks onto the NSV of the [third feminine singular] subject pronoun, viz:



[feminine]

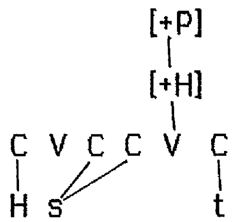
The lexical NSC is specified [+Cl] by default in the lexical component (cf. 5.8.2.) (and subsequently realised as [t]), viz:



[feminine]

A vowel with the specification [+P] is assigned the feature [+H] by default, viz:

D.R. [ ] --> [+H]/[___,+P]



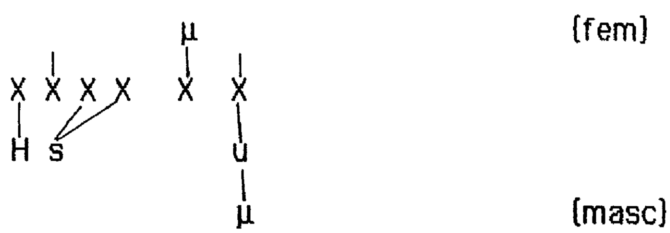
Remaining redundancy rules operate to provide the attested output:

H a s s i t 'she felt'

7.3.4.2. Hubaiʃi:

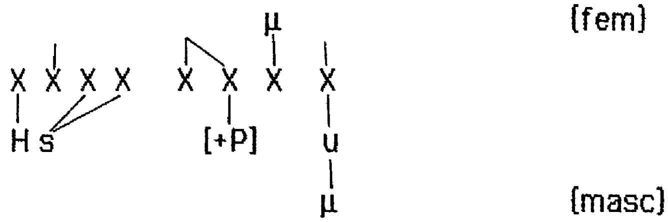
In Hubaiʃi, the {third feminine singular} inflectional form is realised with a final [a], as in <u>Hassa</u> 'she felt', in phonological word-final position. The case of <u>Hasseitu</u> 'she felt it m.', however, requires further explanation. The derivation is as follows:

Suffixation of object pronoun:

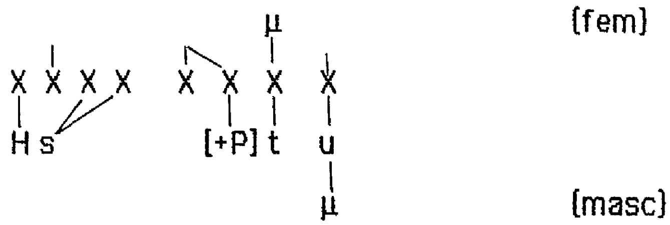


When the {feminine} morpheme occurs to the left of an object pronoun, no rhyme-head is assigned to the X slot of the representation. The lexical NSC associates with this X slot. There is a resulting violation of the condition that a consonant-initial suffix must be preceded by two and only two elements in the rhyme when followed by a vowel-initial suffix (cf.

7.3.3.3.1.3.). In response to this condition, two X slots are epenthesised. The unplaced feature [+P] is associated with the right-most inserted X slot:



The lexical NSC is specified [+coronal] by default in the lexical component (cf. 5.8.1.) (subsequently realsied as [t]), viz:



[+H] is assigned to the [+P] vowel by means of default rule:

D.R. [ ] ---> [+H]/[__,+P]

The default zone of constriction for the NSV is assigned:

D.R. [ ] --> [+G]

At a late stage in the derivation, palatal spread targets the vowel to the left of the [+P] segment as illustrated above (7.3.3.3.2.2.). A vowel marked [+G,+P] is realised as [e], as noted above (7.2.1.1.1.1. and cf. 2.3.1.). Following the application of redundancy rules the form realised is the attested:

H a s s [e i] t u 'she felt it m.'

The present analysis provides an explanation for a previously unexplained rule of allomorphy as far as [feminine] is concerned in Hubaiʃi and in the Raimi dialects. A reason is provided for the analogical levelling between the third weak biliteral and the doubled biliteral verb and an explanation for the similarity between the verb types. By suggesting that biliteral verbs have in common, not only a biliteral as opposed to a triliteral consonantal melody, but also the feature [+P] - which is part of the 'enriched' template of the third weak verb type, but is unplaced in the doubled verb type - substance is given to the unexplained statement that: 'doubled verbs are inflected on analogy with third weak verbs.'

CHAPTER EIGHT

[+R] Spread and Parasitic Harmony

Dialectal variation has been considered in respect to different underlying morphological templates and in respect to dialect specific application of [+H] spread in the case of (feminine singular) morphemes in the perfect aspect of the verb and in the regular noun. In this chapter, the verbal data supplied in chapters four and seven are examined more closely, in particular, to note any cross-dialectal discrepancies in the stems of verbal paradigms. It will be proposed that dialectal variation in respect to vowel quality results from variation in the nature of [+R] spread operating in the lexical component of the grammar. While [+R] spread in the post-lexical component targets the epenthesised NSV whether the target fall within the original morpheme of the trigger segment, or between concatenated morphemes; and, while [+R] may spread from right to left or from left to right onto the epenthetic vowel, it will be seen that morphologically-conditioned [+R] spread as it affects verbal forms is far more restricted in its application. In this chapter, data from Gabiini, Kusmi and Hubaiʃi will be considered. Having observed that [+R] spread affects stem vowels of the verb in the perfect aspect in Kusmi and Hubaiʃi, but not in Gabiini, further consideration will be given to the former two dialects, Kusmi, then Hubaiʃi. In order to establish the environment for [+R] spread, it is important to determine the underlying representation of the (first singular) morpheme. It is seen that /ku/ is the underlying representation in both dialects despite some realised differences. In Kusmi, the realisation [k^W] results from complex consonant formation in phonological word-final position and in intervocalic position. This is a post-lexical process and is seen to be an instance of a more general process of complex consonant formation; the same process affects Kusmi /ki/ of (second feminine singular) and (feminine singular) morphemes which are realised as [k_j] or as [tʃ] in phonological word-final and intervocalic positions today. In Hubaiʃi, while [k^W] is realised in intervocalic position to the left of a (feminine singular) object pronoun, [k] results from a lexical process of vocalic feature disassociation when the morpheme is final in the phonological word (note, also, that complex consonants are ruled out in phonological word-final position (cf. 2.1.1.1.1.2.)). Having established the underlying representation of (first singular) for each dialect, I shall continue to examine [+R] spread, first in Kusmi and then in Hubaiʃi, as it affects the stem vowels of triliteral, hollow, third weak and doubled verb types. It is claimed that lexical [+R] spread is 'parasitic' on the presence of a contextual feature shared by trigger and target(s) in these dialects.

It is claimed in chapter four that the active verbal stem in all three dialects may either have the vocalic melody [+H] or have no specified vocalic melody (cf. 4.2.1.). No active verbal stem has the vocalic melody [+R]. However, if we consider the paradigm of <u>ti^{c}ib</u> 'to tire' in the three dialects it is observed that some inflectional forms of the verb are realised with [u] vowels, viz:

	<u>Gabiini</u>	<u>Kusmi</u>	<u>Hubaiʃi</u>
1s.	t [i] ^{c} [i] b k	t [u] ^{c} [u] b [k^W]	t [u] ^{c} [u] b k
2 m.s.	t i ^{c} i b k	t i ^{c} i b k	t i ^{c} i b k
2 f.s.	t i ^{c} i b ʃ	t i ^{c} i b [tʃ]/[k_j]	t i ^{c} i b k i
3 m.s.	t i ^{c} i b	t i ^{c} i b	t i ^{c} i b
3 f.s.	t i ^{c} i b a t	t i ^{c} i b a t	t i ^{c} i b i
1 pl.	t i ^{c} i b n a a	t i ^{c} i b n a a	t i ^{c} i b n a a

2 m.pl.	t i ^{C} i b k u m	t [u] ^{C} [u] b k u m	t i ^{C} i b k u m
2 f.pl.	t i ^{C} i b k u n	t [u] ^{C} [u] b k u n	t i ^{C} i b k i n
3 m.pl.	t i ^{C} i b u u	t i ^{C} i b u m	t i ^{C} i b u m/u u
3 f.pl.	t i ^{C} i b e e n	t i ^{C} i b e e n	t i ^{C} i b e i n

The discrepancy is seen in the bracketed vowels in Kusmi and Hubaiʃi, where the stem vowels are realised as [u]. Observation of the assumed non-inflected (third masculine singular) form and other inflected forms suggests it would be premature to propose that the underlying representation of this verb were t[u]^{C}[u]b and not the hitherto accepted t[i]^{C}[i]b. The most economical statement would be that, in two of the three dialects a process of [+R] spread is operative in certain environments. Before any decision is reached as to the nature of this process, however, consider other instances of [+R] spread in the dialects:

8.1. Post-lexical [+R] spread:

8.1.1. Epenthesis in utterance-final position:

In all three dialects, [+R] spread operates from a [+R] vocalic trigger to a NSV. In the instances given below, a rhyme-headed X slot is inserted between penultimate and ultimate consonants in utterance-final position when the penultimate consonant is guttural and the ultimate consonant is liquid. Vowel epenthesis, as seen above (cf. 1.3.1.1.2., 2.4.2.1.1.1. and 2.4.2.2.1.), operates in this environment in all three dialects. The NSV associates with the epenthesised X slot and when the vowel of the morpheme is [+R], [+R] spread applies from left-to-right:

/k u H l /	-->	k u H [u] l] φ	'antimony'
/ʃ u gh l /	-->	ʃ u gh [u] l] φ	'work' (Hub.)
/ʃ u ^{C} l /	-->	ʃ u ^{C} [u] l] φ	'work' (Kus./Gab.)

[+R] spread from left-to-right:

[+R]

V V

8.1.2. Epenthesis between concatenated morphemes:

Right-to-left [+R] spread operates when vowel epenthesis has occurred between two concatenated morphemes and the right-most morpheme contains a [+R] vowel (but not when vowel epenthesis has occurred between two phonological words, cf. 1.7.3.1.2., 2.4.2.1.1.1. and 2.4.2.2.1.), as in:

/b a i t k u m/ -->	b e e t [u] k u m	'your m.pl. house' (Kus./Gab.)
/b a i t k u m/ -->	b e i t [u] k u m	'your m.pl. house' (Hub.)

as opposed to:

/b a i t n a a/ -->	b e e t [a] n a a	'our house' (Kus./Gab.)
/b a i t n a a/ -->	b e i t [a] n a a	'our house' (Hub.)

[+R] spread from right-to-left:

[+R]

V V

8.1.3. The imperfect prefix vowel:

Right-to-left [+R] spread also affects the imperfect prefix vowel in all three dialects, viz:

j [i] t^{C} i b	'he tires'
j [i] g l i s	'he sits'
j [i] g i s s	'he sits'
j [i] ʃ m a h	'he sees'

j [u] k t u b 'he writes'

j [u] b S u r 'he sees' (Hub.)

The imperfect prefix vowel is realised as either [u] or [i]. It is realised as [u] when the stem vowel is /u/ and is realised as [i] elsewhere. In chapter two, the vowel of the imperfect prefix is analysed as underlyingly non-specified, receiving its specifications by means of spread from an adjacent [+P] or [+Cl] consonant - i.e. /j/, /t/, or /n/ (cf. 2.4.2.1.1.2.).

8.2. Lexical [+R] spread:

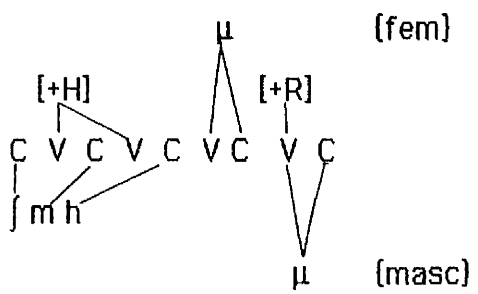
8.2.1. The perfect verbal stem:

8.2.1.1. Kusmi and Hubaiʃi (first singular):

In Gabiini, [+R] spread does not affect the vowels of any perfect verbal stem. In Hubaiʃi and Kusmi, however, as seen above, the [+H] stem vowels of the perfect verb are affected by [+R] spread when the trigger element is in the (first singular) subject pronoun.

8.2.1.2. Kusmi (second plural) and (third feminine singular):

In Kusmi, [+R] spread also affects [+H] vowels in the perfect verbal stem in case the [+R] trigger is in either of the two morphemes (second feminine plural) or (second masculine plural). In addition, [+H] stem vowels of the (third feminine singular) inflectional form are subject to [+R] spread when the (third masculine singular) object pronoun is affixed in this dialect, viz:



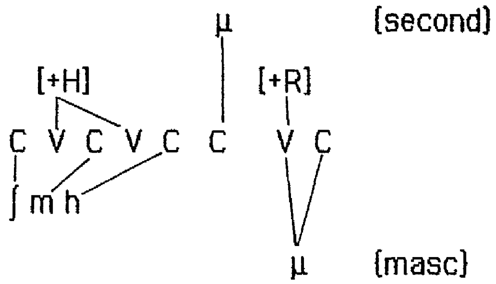
In the post-lexical component, the vowel of the (feminine singular) subject pronoun is subject to syncope following stress assignment, yet the realised form is not realised as:

*ʃ i m i h t u h

rather as:

ʃ [u] m [u] h t u h 'she saw him' (cf. 6.3.2.1.1.1.)

And, similarly, in the case of the affixed (second masculine singular) inflectional form:



This is not realised as :

*ʃ i m i h k u h

rather, as:

ʃ [u] m [u] h k u h 'you m.s. saw him' (and cf. Diem 1973:82)

In both cases, the [+H] vowels of the verbal stem have adopted the [+R] feature of the affix vowel. This is handled in detail below (8.3.5.1.).

Let us now consider Kusmi and Hubaiʃi individually.

8.3. Kusmi:

In the case of Kusmi, it appears that a general process of [+R] spread targets the vowels of some morphemes. As far as [+R] spread targets the vowels of the verbal stem, the trigger is not restricted to one morphemic level: not only does the process occur when the [+R] trigger is in a subject pronoun - as in (first singular) and (second plural) inflectional forms - but also, when the [+R] trigger is in the (third masculine singular) object pronoun - as in the instance of <u>ʃ[u]m[u]ht[u]h</u> 'she saw him' and <u>ʃ[u]m[u]hk[u]h</u> 'you m.s. saw him', given above (8.2.1.2.). It can be said that the target(s) are verbal stem vowels while the trigger may be either in the subject pronoun or in the object pronoun.

8.3.1. Directionality of spread:

Observation of the verb in the passive voice suggests that [+R] spread is restricted in directionality as far as verbal stems are concerned:

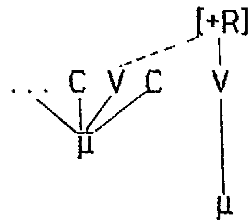
w u f f [i] j a t	'she died'	not	* w u f f [u] j a t
k u t [i] b	'it was written'	not	* k u t [u] b

It has been suggested in chapter four that [+R] is preassociated in the verb and, therefore, cannot spread (cf. 4.2.1.2.1.). It is also seen that the process does not operate from a trigger to a tauto-morphemic target in verbs. It may be said that [+R] spread in Kusmi occurs from right to left from a trigger in one morpheme onto target vowels in an adjacent morpheme.

8.3.2. The operation of [+R] spread:

Since [+R] spread in the perfect aspect of the verb appears to be sensitive to morphological structure, spread must apply prior to the erasure of morphological information by means of tier conflation. I tentatively hypothesise the following whereby [+R] spreads leftwards from one morpheme onto the stem vowels of the verb in the perfect aspect:

8.3.2.1. [+R] spread:



(perfect active)

If we are to say simply that [+R] spreads from right to left from one morpheme to vocalic targets in an adjacent morpheme (the verbal stem), however, unattested forms such as the following would not be filtered out:

* ʃ [u] m [u] h u m   for ʃ [i] m [i] h u m   'they m. saw'

It appears that the presence of some intervening C between the trigger and target morpheme is necessary; however, this would imply that [+R] spread is not lexical, and that it applies after the application of tier conflation. Moreover, the quality of the intervening consonant is not immaterial. This latest revision still generates unattested forms, such as:

*ʃ [u] m [u] h h u m for ʃ [i] m [i] h h u m   'he saw them m.'

The intervening consonant must either be lexically non-specified - realised by default as [t] - or bear a feature which is compatible with labialisation and rounding - i.e., [+H], and thus, /k/.

However, even this additional specification generates unattested forms, such as:

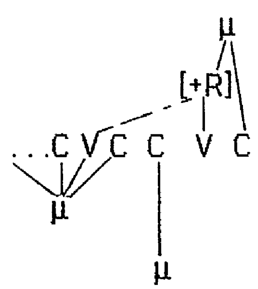
*ʃ [u] m [u] h k u m for ʃ [i] m [i] h k u m   'he saw you m.pl.'

*ʃ [u] m [u] h k u n for ʃ [i] m [i] h k u n   'he saw you f.pl.'

It appears that it is not consonants (i.e. phonological elements) per se, but rather morphologically-specified elements which condition the operation of [+R] spread. The rule does not apply when the consonant is the initial element of an object pronoun, but does apply when the consonant is the initial element of the subject pronoun. The rule either applies when the [+R] trigger is in the subject pronoun (i.e. {first singular} or {second plural}), or when the [+R] trigger is in the object pronoun (i.e. {third masculine singular}) and the subject pronoun is {third feminine singular} or {second masculine singular}. The rule may be formulated as i) and as ii) below:

8.3.2.2. [+R] spread:

i)

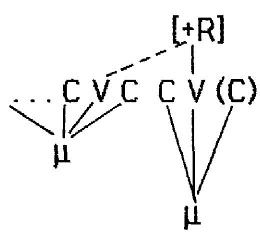


{masc}

{perfect active}

{feminine}/{second}

ii)



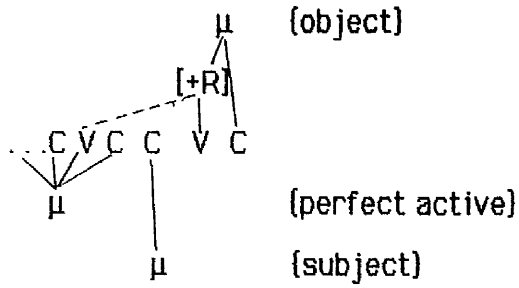
{perfect active}

{first sing}/{second plural}

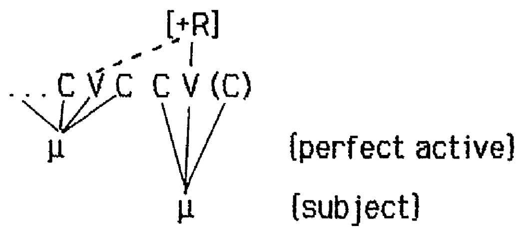
The rule may be simplified still further, since /t/ and /k/ are the only possible consonants which occur as verbal subject pronouns to the immediate left of an object pronoun - for, when the subject pronoun is <u>[n]aa</u> 'we' in Kusmi, the unsyllabified vowel triggers epenthesis of an X slot (subsequently filled by the NSC and realised as [h] following [+Ct] spread), i.e. <u>ʃimihnaa[h]ah</u> 'we saw her'; and <u>ʃimihnaa[h]uh</u> 'we saw him' (cf. 1.7.2.3.1.) and, in contrast to Hubaiʃi, R_i disassociation does not occur. I simply repeat the rules above and omit inflectional information, as below:

8.3.2.3. [+R] spread revised:

i)



ii)



8.3.3. The representation of [first singular]:

Returning to the data, it is seen that the rule spreading [+R] as posited above will account for rounding of the perfect stem vowels of the [second masculine singular] and [second plural] inflectional forms (trigger vowels are bracketed), yet not so easily for the rounding of stem vowels in the [first singular] inflectional form:

	ʃ u m u h k [u] h	'you m.s. saw him'
	t u ^{c} u b k [u] m	'you m.pl. tired'
	t u ^{c} u b k [u] n	'you f.pl. tired'
however,	t u ^{c} u b [k^{W}]	'I tired'

In the case of the [second] inflectional forms, [+R] spreads, as stated in the rule, from a vocalic trigger to a vocalic target in an adjacent morpheme. In the case of [first singular], [+R] appears to spread from a consonantal trigger to a vocalic target. However, since [k^{W}] is restricted in occurrence to the [first singular] perfective subject pronoun in this dialect, I suggest that the [+R] feature in [k^{W}] is the residue of a round vowel, and this will be demonstrated below. Let us return to the negative condition which states that non-branching rhymes are ruled out in utterance-final position:

```
*      R
       |
       N
       | \
       X  (X) ]φ   (cf. 1.4.5.4.)
```

This is reviewed in chapters one, two and three above; one of the processes available to preserve structure in case a morpheme with a final short vowel should occur in utterance-final position in Kusmi is complex consonant formation (cf. 2.1.1.1.1.2.). It appears that complex consonant formation affects the final vowel of the {first singular} subject pronoun in the perfect aspect of the verb in Kusmi. It is hypothesised that complex consonant formation originally affected the form in utterance-final position and, subsequently, has been generalised to phonological word-final position since no short marked vowels – i.e. [i] or [u] – occur in phonological word-final position in either Kusmi or Gabiini today.

8.3.4. Complex consonant formation:

8.3.4.1. Palatalisation in {feminine singular} morphemes:

To this end, consider the case of the {second feminine singular} object pronoun/possessive determiner and subject pronoun in the perfect aspect of the verb in Kusmi: in phonological word-final position and in intervocalic position the {second feminine singular} morphemes are realised as either [k_j] or [tʃ]. It is maintained that the {second feminine singular} morpheme has an underlying representation of /ki/ and that the palatalised realisations, [k_j] and [tʃ], result from complex consonant formation. It is also assumed that complex consonant formation was restricted to utterance-final position at one stage and, as such, is a reflex of the 'kaʃkaʃa' and 'kaskasa' phenomena recorded for the tribes of Rabii^{C}a, Bakr, Asad and Tamiim (Barth 1910, Lisan VIII:153); it was subsequently generalised to phonological word-final position. The morpheme to the left of a consonant-initial suffix is realised as [ki] (or as [kii] when the morpheme is penultimate in the phonological word), as in:

m a a ʃ i m i h [k i] n i i ʃ 'you f.s. didn't see me' and

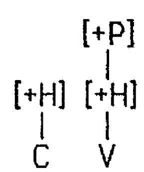
m a a ʃ i m i h [k i i] ʃ 'you f.s. didn't see'

Complex consonant formation is diagrammed below (and cf. 0.4.1.5.3.4.):

8.3.4.1.1. Complex consonant formation:

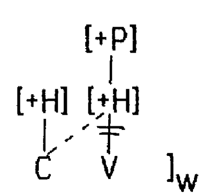
Firstly, [+P] is associated to the high vowel by default rule:

D.R. [ ] ---> [+P]/[___,+H]



In phonological word-final position, the feature matrix is disassociated from the vowel and the now unassociated root node reassociates with the slot of the adjacent [+H] consonant, viz:

Complex consonant formation:



Note that whether complex consonant formation produces [tʃ] or [k_j] is dependent on phonetic realisation, the details of which are not considered in this thesis. It is tentatively assumed, however, that where complex consonant formation produces [tʃ] some, but not all of the feature matrix associated with the vowel reassociates - i.e. the root node, [+P] and [+Ct] reassociate, but not [+Sn] or [+V].

8.3.4.1.1.1. In phonological word-final position, the prosodic category of the initial element of the following word determines whether the NSV associates with the empty rhyme-headed X slot following feature disassociation, or whether the empty rhyme-headed slot is subject to deletion (by means of R_i disassociation, cf. 1.7.2.1.): that is to say, to the left of a vowel-initial word R_i disassociation is triggered by the unsyllabified vowel (cf. 1.7.2.1.), just as in utterance-final position bare nucleus deletion is invoked (cf. 2.1.1.1.1.); to the left of a consonant-initial word, however, the NSV associates with the empty rhyme-headed X slot (and is realised by default as [a]) in order to comply with the syllable template for the language. Although it initially appears that complex consonant formation may be lexical in this instance, for [tʃ] and [k_j] occur only when (feminine singular) forms are involved, as in the following examples:

sbj.	t i ^{C} i b [tʃ]/[k_j]	'you f.s. became tired'
obj.	H a a l i [tʃ]/[k_j]	'your f.s. state'

and in the (feminine singular) demonstrative:

h a a dh i i [tʃ]/[k_j] 'that f.s.'

this is simply due to the fact that final /ki/ is restricted to (feminine singular) morphemes. No other morpheme could present /ki/ in phonological word-final position.

8.3.4.1.1.2. [tʃ] and [k_j] are realised not only in phonological word-final position, but also in intervocalic position (cf. 1.7.2.2.2.), viz:

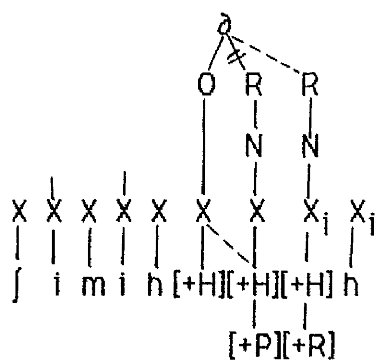
ʃ i m i h [tʃ] u h	'you f.s. saw him'
ʃ i m i h [k_j] a h	'you f.s. saw her'

To the left of a vowel-initial object pronoun, [tʃ] and [k_j] are realised by means of complex consonant formation. That is to say, the unsyllabified vowel triggers R_i disassociation after [+P] has been assigned to the [+H] vowel by default, viz:

D.R. [ ] ---> [+P]/[__,+H]

The vocalic feature matrix subsequently reassociates leftwards with the slot of the adjacent [+H] consonant, viz:

8.3.4.1.2. R_i disassociation and complex consonant formation:



---> ʃ i m i h [tʃ]/[k_j] u h

'you f.s. saw him'

8.3.4.2. (First singular):

Just as the palatalised variants of (second feminine singular) are seen to be derived from /ki/ by means of complex consonant formation, so, returning to (first singular) in Kusmi, labialised [k^W] is seen to stem from an underlying consonant-vowel sequence: in the 'emphatic style' variant of (first singular), the round vowel may return, viz:

t u ^{c} u b k [u u] $]_{W}$ 'I <u>tired</u>'

In utterance-final position, the final element of this form would, of course, be desyllabicised to produce:

t u ^{c} u b k u [w]] φ 'I tired' (cf. 2.1.1.2.1.)

When a consonant-initial morpheme is suffixed to the {first singular} inflectional form, the morpheme is realised as [ku]. In negation, therefore, we note:

m a a ʃ u m u h [k u] ʃ 'I didn't see'

And to the left of a consonant-initial object pronoun [ku] is also attested, as in:

ʃ u m u h [k u] k u m 'I saw you m. pl.'

In the suffixed forms given above the round vowel does not appear to lengthen. I am still not sure why this is, however, although it could be due to the tentative status of the vowel in this morpheme.

When the {third masculine singular} object pronoun occurs to the left of the {first singular} subject pronoun [kuu] is realised, viz:

ʃ u m u h [k u u] h 'I saw him'

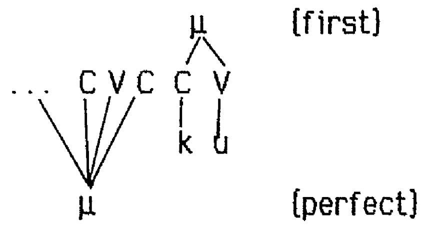
It is noted that the occurrence of labialised [k^{W}] of the {first singular} subject pronoun (like the palatal [tʃ] of {feminine singular} forms) is not restricted to phonological word-final position. Also to the left of a vowel-initial object pronoun (but not the {third masculine singular} object pronoun, as seen above) [k^{W}] is realised, viz:

ʃ u m u h [k^{W}] a h 'I saw her'

ʃ u m u h [k^{W}] a k 'I saw you m.s.'

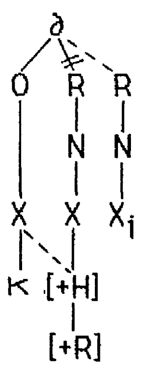
Evidence does indicate that complex consonant formation affecting morpheme-final /u/ as well as morpheme-final /i/ is a synchronic process in Kusmi.[1]

8.3.4.2.1. The underlying representation of Kusmi [first singular] in the perfect aspect of the verb is therefore posited as /ku/ (and cf. Blau 1983:531), viz:



This representation enables us to provide a natural account of the variants given above: before a vowel-initial object pronoun, the unsyllabified vowel triggers R_i disassociation and the feature matrix associated with R_i reassociates with the adjacent [+H] consonant (i.e. as an instance of complex consonant formation, cf. 0.4.1.5.3.4. and 1.7.2.2.2.):

8.3.4.2.1.1. R_i disassociation and complex consonant formation:



as in:

/q a t a l k u + a k/ --> q a t a l [k^W] a k 'I killed you m.s.'

/q a t a l k u + a h/ --> q a t a l [k^W] a h 'I killed her'

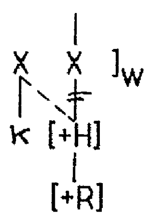
1. Complex consonant formation deriving from /u/ in phonological word-final position is also attested in one of the group of Gurage languages (Leslau 1950:14).

Before a consonant-initial object pronoun or the negative suffix, /ʃ/, the vowel of the (first singular) subject pronoun is maintained to concur with the Well-formedness Condition for syllabification (1.5.1.):

/q a t a l k u + k u m/ --> q a t a l k [u] k u m 'I killed you m.pl.'

8.3.4.2.1.2. In phonological word-final position, complex consonant formation is invoked (cf. 2.1.1.1.1.2.). Whether the NSV associates with the empty rhyme-headed X slot, or whether the slot is deleted (by means of R_i disassociation) depends on the prosodic category of the initial element in the following word, as illustrated below (and cf. 2.1.1.1.1.2. and 8.3.4.1.1.1.).

Complex consonant formation:



/q a t a l k u / - -> q a t a l $[k^W]]_W$ 'I killed'

When a consonant-initial word follows, the NSV associates with the empty X slot. When a vowel-initial word follows, the unsyllabified vowel triggers R_i disassociation. The following forms are attested:

q a t a l $[k^W]]_W$ [a] k a l b 'I killed a dog'

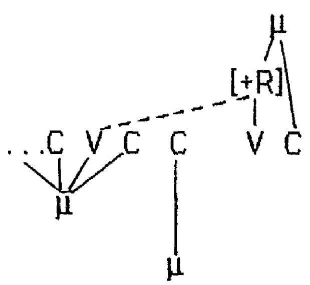
ʃ u m u h $[k^W]]_W$ i b n i i 'I saw my son'

8.3.5. [+R] spread:

Having established the representation of the (first singular) subject pronoun in the perfect aspect of the verb as /ku/, I now turn to re-examine [+R] spread as it affects the stem vowels of the perfect verb in Kusmi. It is seen that [+R] stems from a [+R] vowel in the subject pronoun (or in the object pronoun in the (second masculine singular) or (third feminine singular) inflectional forms). However, the formulation of [+R] spread, as posited above (cf. 8.3.2.3., and repeated below for convenience) fails to account for its lack of application in case the verbal stem has no specified vocalic melody - i.e. the vowels of the verbal stem are realised by default as [a].

[+R] spread:

i)

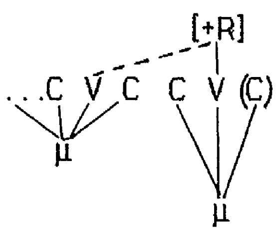


(object)

(perfect active)

(subject)

ii)



(perfect active)

(subject)

The rule, as expressed above in its two parts, would generate the following unattested forms:

*q u t u l [k^W]	for q [a] t [a] l [k^W]	'I killed'
*k u t u b [k^W]	for k [a] t [a] b [k^W]	'I wrote'
*q u t u l k u m	for q [a] t [a] l k u m	'you m.pl. killed'

and also:

*k u t u b t u h	for k [a] t [a] b t u h	'she wrote it m.'
*q u t u l k u h	for q [a] t [a] l k u h	'you m.s. killed him'

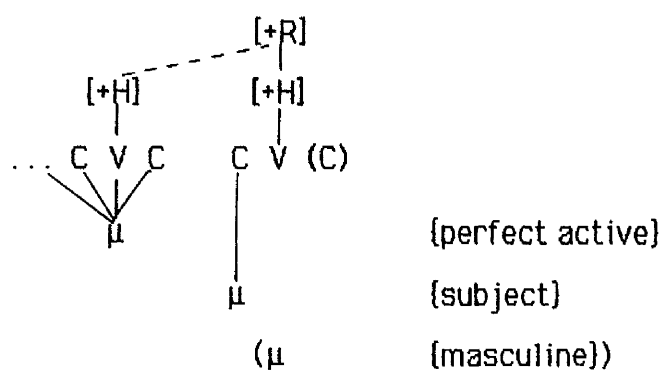
8.3.5.1. [+R] spread as an instance of 'parasitic' harmony:

Since most assimilatory processes operate in a feature-filling way and are blocked only by specification for the harmonic feature (Kiparsky, repeated in Cole 1987:4), how can the NSV be unaffected by [+R] spread? Note, however, that all instances of [+R] spread in Kusmi in the lexical component apply from a [+H] trigger to [+H] target vowels in an adjacent morpheme. [+R] spread, in all cases, affects all and only contiguous vowels which are specified [+H]. We say that in the lexical component [+R] spread is 'parasitic' on the presence of the contextual feature [+H]. Any element which does not have this contextual feature is not affected by [+R] spread. While Cole states that:

> 'In parasitic harmony, an additional class of blocking segments is created by the presence of segments which do not bear the appropriate contextual features.' (Cole 1987:27)

it is claimed, not that NSSs <u>block</u> spread in the present case, but rather that they are unaffected by spread by virtue of the fact that they lack specification both for the contextual feature <u>and</u> for the harmonic feature. They may be transparent in respect to spread. Parasitic harmony in this case is diagrammed as below:

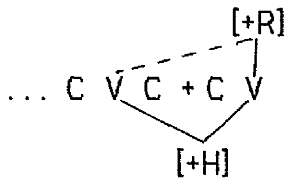
8.3.5.1.1. Parasitic harmony:



(This representation expresses the fact that where [+R] is not in the subject pronoun, it may be in the object pronoun - {third masculine singular}).

More economically, [+R] spreads from a [+R] trigger vowel to target vowels which share a dependent contextual feature with the trigger; the representation above fails to capture the significance of the fact that the contextual feature must be identical for target(s) and trigger. I invoke the Linked Structure Analysis (Cole 1987:28-9), expressed here in bi-planar representation:

Linked Structure Analysis:



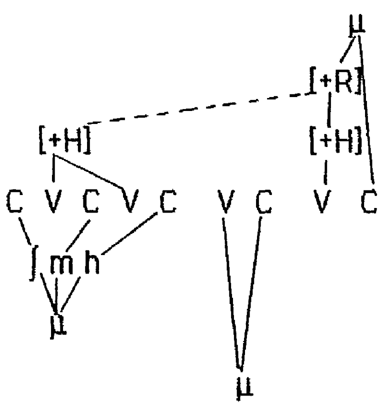
The Linked Structure Analysis expresses the fact that harmonic spreading of [F] is dependent on the prior association of a contextual [A].

While post-lexical [+R] spread affects the NSV in either direction, as in beet[u]kum 'your m.pl. house', kuH[u]l]$_q$ 'antimony' (cf. 2.4.2.2.1.), [+R] spread in the lexical component is conditioned by the presence of a shared contextual feature. Vowels not specified [+H] are not targeted by [+R] spread precisely because the relevant contextual feature is lacking. In the post-lexical component, [+R] spread does not affect the underlying NSVs of some verbal stems since, by this time, the default value [+G] has been supplied to these vowels by redundancy rule. At this stage, it is the presence of [+G] which blocks spread.

8.3.5.1.2. [+R] spread as it affects [+H] stem vowels in the {third feminine singular} inflectional form:

The notion 'parasitic' spread enables us to explain the spread of [+R] from an object pronoun (i.e. {third masculine singular}) to [+H] target vowels in the verbal stem of the {third feminine singular} inflectional form. As noted in chapter six, the lexical representation of the {third feminine singular] subject pronoun in the perfect aspect of the verb in Kusmi is a NSV followed by a NSC. These NSSs are not targets for [+R] spread precisely because they do not possess the requisite contextual feature, [+H]. They can similarly not block [+R] spread because, at this stage, they lack specification for the harmonic feature. Elements of the [feminine] morpheme are therefore transparent in respect to spread. When the [third masculine singular] object pronoun is suffixed, [+R] spread targets the [+H] vowels of the verbal stem. This is diagrammed below:

8.3.5.1.2.1. [+R] spread:



(masc)

consonantal root

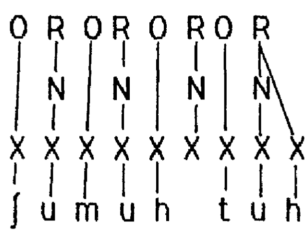
(fem)

Some redundancy rules apply in the lexical component to specify the lexical NSC as [+Cl], viz:

L.D.R. [ ] ---> [+Cl] (cf. 5.8.2.)

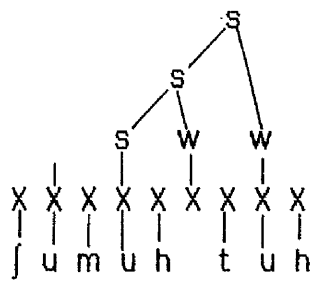
Syllabification proceeds from left-to-right, viz:

Syllabification:



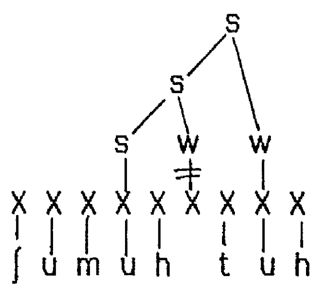
This is followed by the assignment of word stress. In accordance with the stress algorithm, if the ultimate syllable is not superheavy, the right-most non-final heavy syllable receives stress; if there is no non-final heavy syllable in the word, the antepenultimate syllable or the first syllable receives stress (whichever is right-most in the word, cf. 1.4.3.2.). Stress is therefore assigned to this form as below:

Stress:



The stressless vowel is subsequently subject to syncope (and cf. 6.3.2.1.1.), viz:

Syncope:



The output of syncope is syllabified and remaining redundancy rules apply to provide the realisation:

ʃ u m u h t u h 'she saw him'

To conclude, in Kusmi [+R] spread occurs from a [+R] trigger to a [+H] vocalic target in an adjacent morpheme. [+R] spread, as it targets stem vowels of the perfect verb, is parasitic on the presence of the contextual feature [+H]. Absence of this contextual feature prevents spread targeting that segment. It is observed that [+R] spread as it affects the verb in the perfect aspect does not apply indiscriminately from any [+R] subject/object pronoun. It is not triggered, for example, from (third masculine plural), nor is it triggered from the (second plural) object pronouns. This suggests an additional conditioning factor. It is observed that [+R] spread targets vowels of the perfect verbal stem only in the environment of a consonant-initial subject pronoun - viz: /t/ or /k/. In terms of (first singular), it is observed that /ku/ is the lexical representation of this morpheme. Today, [ku] is realised to the left of a consonant-initial object pronoun or the negative suffix, /ʃ/; for some speakers, [kuu] is realised when the verb is emphasised in phonological word-final position. In intervocalic position and in phonological word-final position, in the general case, complex consonant formation occurs to produce [k^W].

8.3.6. The weak verbs:

Consideration of paradigms of the weak verb types demonstrates, however, that the process of [+R] spread in Kusmi is not as straight-forward as may have been imagined initially. In the third weak and doubled verbs, [+R] spread affects the stem vowel of the (first singular) inflection only. In the hollow verb it is seen that, while the verbal stem vowel in the (first singular) inflectional form is invariably realised as [u], in (second plural) inflectional forms it need not be. I shall deal with the hollow verb in the first instance:

8.3.6.1. The hollow verb:

'to be'

k [u] n [k^W]	'I was'	k [u] n n a a	'we were'
k [u] n k	'you m.s were'	k [u] n k u m	'you m.pl. were'
k [u] n [tʃ]/[k_j]	'you f.s. were'	k [u] n k u n	'you f.pl. were'
k [a a] n	'he was'	k [a a] n u m	'they m. were'

k [a a] n a t	'she was'	k [a a] n e e n	'they f. were'

<u>'to go'</u>

s [u] r [k^W]	'I went'	s [i] r n a a	'we went'
s [i] r k	'you m.s. went'	s [i] r k u m	'you m.pl. went'
s [i] r [tʃ]/[k_j]	'you f.s. went'	s [i] r k u n	'you f.pl. went'
s [a a] r	'he went'	s [a a] r u m	'they m. went'
s [a a] r a t	'she went'	s [a a] r e e n	'they f. went'

<u>'to get up'</u>

q [u] m [k^W]	'I got up'	q [u] m n a a	'we got up'
q [u] m k	'you m.s. got up'	q [u] m k u m	'you m.pl. got up'
q [u] m [tʃ]/[k_j]	'you f.s. got up'	q [u] m k u n	'you f.pl. got up'
q [a a] m	'he got up'	q [a a] m u m	'they m. got up'
q [a a] m a t	'she got up'	q [a a] m e e n	'they f. got up'

The vowel of the shortened stem is either realised as [u] or as [i] unless the inflectional form is {first singular} in which case it is invariably realised as [u]. Quite clearly, the feature associated with the vowel of the hollow verb takes precedence over the spread feature.

8.3.6.1.1. The stem vowel of the hollow verb:

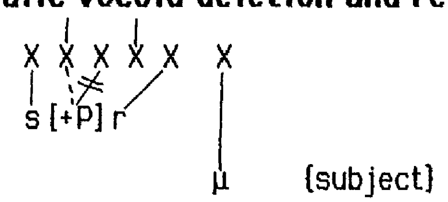
As seen in chapter seven above, in Kusmi, as in Gabiini, the quality of the short vowel in inflected forms of the perfect aspect of the verb generally is identical to that of the long vowel in the imperfect aspect, viz:

<u>3 m. sg.</u>	<u>3 m. sg.</u>	<u>2 m. pl.</u>	<u>1 pl.</u>
k a a n	j u k [u u] n	k [u] n k u m	k [u] n n a a
q a a m	j u q [u u] m	q [u] m k u m	q [u] m n a a
s a a r	j i s [i i] r	s [i] r k u m	s [i] r n a a

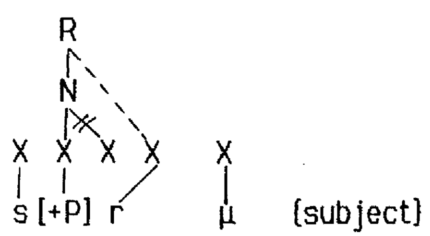
This parallelism contrasts with the general lack of parallelism in the sound triliteral verb. In the sound triliteral verb, when there is no vocalic melody in the perfect aspect, the stem vowel may be [+R], non-specified or [+H] in the imperfect aspect; when the stem vowel of the verb is [+H] in the perfect aspect, it is almost invariably non-specified in the imperfect aspect, and never [+R] (and cf. McCarthy for CA, 1985:292). In the perfect aspect, the feature [+R] is always derived in the sound triliteral verb and is not available underlyingly. In the hollow verb, in contrast, there is a direct correlation between the quality of the short vowel in the inflected perfect stem and that of the long imperfect vowel in the unmarked case.

The vowel in the Raimi dialects, Kusmi and Gabiini, may be realised as [u] or as [i] in the short inflected stem of the hollow verb in the perfect aspect; it may never be realised as [a]. The [u] of the above forms (e.g. q[u]nkum 'you m.pl. got up' and k[u]nkun 'you f.pl. were') does not result from any process of [+R] spread, but rather is lexically specified for the verb. Recall how the quality of the short vowel of the hollow verb results from reassociation of the delinked C_{ii} zone of constriction ([labial] or [palatal]) with the left-most vowel of the stem (cf. 7.1.2.1.2.), followed by closed syllable construction (cf. 7.1.2.1.3.), viz:

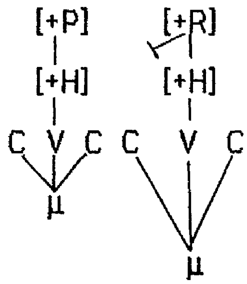
Intervocalic vocoid deletion and reassociation:



Closed syllable construction:



Even though the potential target vowel is specified, by default, [+H], spread is blocked by the presence of [+P], viz:



(perfect)
(second plural)

This is because universal default rules state that a [+P] vowel is not round and that a [+R] vowel is not palatal, viz:

D.R [ ] ---> [-R]/[___,+P]

D.R. [ ] ---> [-P]/[___,+R]

8.3.6.1.2. [+R] spread and (first singular):

However, if the lexical feature of the stem vowel takes precedence over the spread feature, thereby blocking [+R] spread, how can the realisation of the (first singular) inflectional form be explained? I repeat the data below:

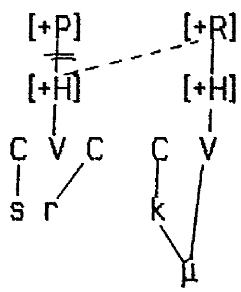
s [u] r [k^W] 'I went' v. s [i] r k u m 'you m.pl. went'

In the case of (first singular), the stem vowel is invariably realised as [u]. This apparent anomaly can be resolved only if it is accepted that the rule which induces rounding of the perfect stem vowel in the (first singular) inflectional form is a specific instance of a more general process of [+R] spread. While spread and assimilation rules are feature-filling in the unmarked case, language-particular learned rules take precedence over more general rules and universal default rules. As Broselow notes:

> 'Rules which are more sensitive to the structure of a string tend to be ordered earlier in the grammar.' (Broselow 1976:193)

That is to say, the more morphological information required by the rule, the earlier the rule will be ordered in the grammar. [+R] spread as it targets the perfect stem vowel in the (first singular) inflectional form requires more morphological information than does the general process of lexical [+R] spread. In the case of (first singular), the information required is (first singular); in the case of all other instances of lexical [+R] spread, the information required here is (subject) (C-initial). Exceptionality of the rule as it affects (first singular) allows the spread feature, [+R], to take precedence over the lexical feature of the hollow verb, which has to be disassociated prior to spread, viz:

8.3.6.1.2.1. [+P] disassociation:



(first)

[+P] is disassociated, then [+R] spreads parasitically, to provide the output: surku. Complex consonant formation occurs, as detailed above (cf. 8.3.4.2.1.2.), in phonological word-final position to provide the attested output:

s [u] r [k^W] 'I went'

8.3.6.2. The third weak verb:

In the case of third weak verbs, data are provided as follows. The paradigm given is that of raDha[+P] 'to want':

r a Dh o o [k^W]	'I wanted'
r a Dh e e k u m	'you m.pl. wanted'
r a Dh e e k u n	'you f.pl. wanted'
r a Dh e e n a a	'we wanted'

r a Dh e e k	'you m.s. wanted'
r a Dh e e [tʃ]/[k$_j$]	'you f.s. wanted'
r a Dh e e n	'they f. wanted'
r a Dh u m	'they m. wanted'
r a Dh a	'he wanted'
r a Dh i t	'she wanted'

In this case, [+R] spread targets the right-most stem vowel to the left of the (first singular) subject pronoun. As I have argued above (cf. 7.2.1.1.), the morphological template for this verb type is similar to that of the sound triliteral verb (cf. 4.3.), viz:

X X X X X

Where final weak verbs differ from sound triliteral verbs is in a deficient consonantal melody, viz:

X X X X X
r Dh

Spreading of the second consonant onto the final X slot does not occur because the morphological template has 'enrichment' - i.e. [+P] is associated with the final element of the template:

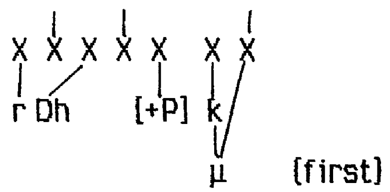
X X X X X
r Dh [+P]

There is no specified vocalic melody. As has been established above, [+R] spread affects all and only contiguous segments which are compatible in terms of their feature specification with labialisation and rounding. In this case (as in the case of the hollow verb type) the presence of [+P] to the left of the (second plural) subject pronouns blocks the application of

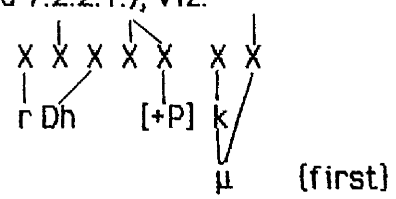
[+R] spread in these inflections. However, as in the case of the hollow verb type, [+R] spread in this verb type does affect the (first singular) inflectional form. Consider the derivation of raDhoo[k^{W}] 'I wanted':

8.3.6.2.1. Lexical component:

input:



To the left of a consonant, the [+P] feature is linked to a nuclear slot (cf. 2.1.2.1. and 7.2.2.1.), viz:

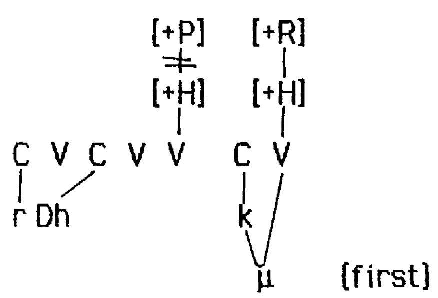


[+H] associated by default rule:

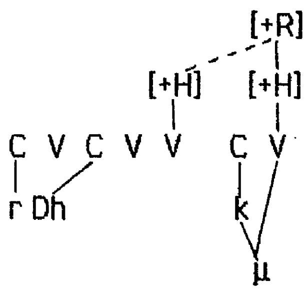
D.R. [ ] ---> [+H]/[___,+P]

As in the case of the hollow verb, [+P] is disassociated to the left of (first singular). [+R] then spreads parasitically onto the [+H] segment, viz:

[+P] disassociation:



[+R] spread:

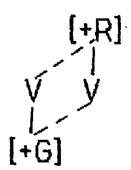


(first)

8.3.6.2.2. Post-lexical component:

Coalescence occurs at a low level in the derivation affecting the final elements of the verbal stem since the sequences /au/ and /ai/ are never realised as [au] and [ai] in any of the dialects examined here; in Kusmi and Gabiini they are realised as long mid-vowels (cf. 2.2. and 7.2.2.1.1.). Firstly, redundancy rules apply supplying the default zone of constriction to the NSV as [+G], [+H] is disassociated from the [+R] vowel, then [+G] spreads rightwards onto the zone of constriction of the [+R] vowel as the labial node spreads leftwards onto the zone of constriction of the [+G] vowel. Coalescence is expressed for convenience as below (cf. 7.3.3.3.2.1.):

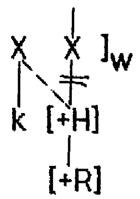
Coalescence:



Vowels specified [+R,+G] are realised as [o] (cf. 2.3.1.).

Complex consonant formation:

In phonological word-final position, the feature matrix associated with the final vowel is disassociated and complex consonant formation takes place (cf. 2.1.1.1.1.2.):



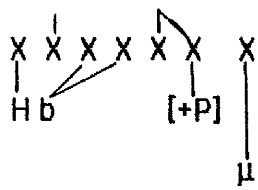
The final output is the attested: r a Dh o o [k^W] 'I wanted'

8.3.6.3. The doubled verb:

[+R] spread as it affects the stem vowels of the (first singular) perfect inflection of the doubled verb behaves in the same way as for the final weak verb reviewed above. Consider the full paradigm of <u>Habb</u> 'to love'. Forms are provided in their word-final state:

H a b b o o [k^W]	'I loved'
H a b b e e n a a	'we loved'
H a b b e e k	'you m.s. loved'
H a b b e e k u m	'you m.pl. loved'
H a b b e e [tʃ]/[k_j]	'you f.s. loved'
H a b b e e k u n	'you f.pl. loved'
H a b	'he loved'
H a b b u m	'they m. loved'
H a b b i t	'she loved'
H a b b e e n	'they f. loved'

[+R] spread is parasitic on the presence of [+H], as noted above (8.3.5.1.1.). With the affixation of a consonant-initial object pronoun, lexical epenthesis occurs in the doubled verb to concur with the condition that the rhyme to the left of an ultimate suffix contains two elements (cf. 7.3.3.3.1. and 7.3.3.3.1.3.). Two X slots are inserted and, as a result of analogical levelling at some time with third weak verbs, [+P] has become associated with the right-most inserted X slot, viz:



(first)/(second)

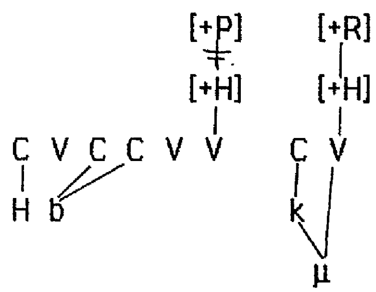
To the left of a consonant, [+P] is linked to a nuclear slot (cf. 2.1.2.1.).

8.3.6.3.1. [+R] spread:

The feature [+P] associated with the final slot of the stem serves to block [+R] spread in the (second plural) inflectional forms as in the case of the third weak verb. When the inflectional suffix is (first singular), however, as shown above (cf. 8.3.6.2.1.), [+P] is disassociated following the assignment of [+H] by default rule:

D.R. [ ] ---> [+H]/[___,+P]

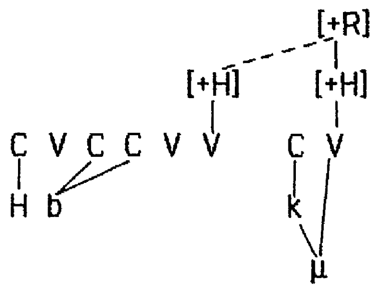
[+P] disassociation:



(first)

Once [+P] has been disassociated, [+R] spreads parasitically from the (first singular) subject pronoun to the adjacent [+H] target, viz:

[+R] spread:

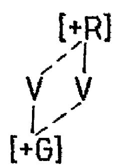


[first]

Post-lexical component:

As observed above (8.3.6.2.2.), at a low level in the derivation redundancy rules supply the NSV with the default zone of constriction [+G] before coalescence occurs to derive [oo] from /au/.

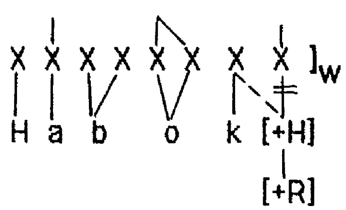
Coalescence:



(cf. 8.3.6.2.2.)

In phonological word-final position, the feature matrix associated with the final vowel is disassociated. Complex consonant formation then occurs (cf. 2.1.1.1.1.2.):

Complex consonant formation:



This provides the attested output: H a b b o o [k^{W}] 'I loved'

8.4. Hubaiʃi:

8.4.1. Sound triliteral verbs with [+H] vocalic melody:

I shall now examine the Hubaiʃi data. Consider the full paradigm of the sound triliteral verb of the CiCiC verb type, ti^{c}ib 'to tire':

	sg.	pl.
3.m.	t i ^{c} i b	t i ^{c} i b u u/m
3.f.	t i ^{c} i b i	t i ^{c} i b e i n
2.m.	t i ^{c} i b k	t i ^{c} i b k u m
2.f.	t i ^{c} i b k i	t i ^{c} i b k i n
1.	t [u] ^{c} [u] b k	t i ^{c} i b n a a

As in Kusmi, [+R] is a feature of the (first singular) inflectional form. However, in contrast to Kusmi, it will be seen that [+R] does not associate with the stem vowels of any inflected form except (first singular). In Hubaiʃi, lexical [+R] spread appears to require more specific morphological information than in Kusmi.

8.4.2. Sound triliteral verbs with no specified vocalic melody:

Not only does [+R] spread affect the stem vowels of the (first singular) inflectional form when the vocalic melody of the verb is [+H], it also targets the right-most stem vowel when there is no specified vocalic melody. Consider the paradigm of qatal 'to kill':

	sg.	pl.
3.m.	q a t a l	q a t a l u u/m
3.f.	q a t a l a	q a t a l e i n
2.m.	q a t a l k	q a t a l k u m
2.f.	q a t a l k i	q a t a l k a n
1.	q a t [u] l k	q a t a l n a a

Behnstedt, in recording dialects of the Yemeni western mountain range, supplies the following list of attested forms for four different dialects:

<u>first sing. perf.</u>	<u>second m. sing. perf.</u>	
k a t a b k	k a t a b k	
k a t [u] b k	k a t a b k	
k a t a b [k^W]	k a t a b k	
k a t a b k [u]	k a t a b k	(Behnstedt 1985)

This suggests that [+R] is a feature of the {first singular} inflectional form in some dialects with the function of differentiating between {first singular} and {second masculine singular} in the perfect aspect of the verb. Diem similarly records <u>kat[u]bk</u> 'I wrote' and <u>katabk[u]</u> 'I wrote' for dialects of this region (Diem 1973:100).

8.4.2.1. The significance of phonological word-final position:

Unfortunately, having correctly identified the above surface forms, what all investigators fail to appreciate is that some of the forms recorded are restricted in occurrence to a certain environment, namely, phonological word-final position. Further data from Hubaiʃi, inclusive of word-boundary information, serves to complicate the picture:

q a t [u] l k $]_W$	'I killed'
q a t [a] l k u u	'I killed him'
q a t [a] l [k^W] i i	'I killed her'
q a t [a] l k [u u] k	'I killed you m.s.'
q a t [a] l [k^W] i i k	'I killed you f.s.'
m a a q a t [a] l k [u u] ʃ	'I didn't kill'/'I didn't kill him'

It is clear that whatever process operates to round the right-most stem vowel of a verb with no specified vocalism is applicable if and only if both the following conditions are met:

1) the form is {first singular} in the perfect aspect of the verb;
2) the suffix is final in the phonological word.

When the verb is a derived form, the right-most stem vowel is similarly realised as [u] in phonological word-final position, viz:

x a z z [u] n k	'I chewed qat'
x a a b [u] r k	'I chatted'
? a b S [u] r k	'I saw'
(? a) t H a z [u] b k	'I read (the Qur'ān)'
(? a) t s a r w [u] l k	'I put on <u>sirwaal</u>'

In contrast to verb forms with no vocalic melody, the stem vowels of verbs with [+H] vocalic melody are affected by [+R] spread when the inflectional form is {first singular} in any environment, viz.

T [u] l [u] ^{C} k $]_{W}$	'I went up'
T [u] l [u] ^{C} k u u	'I went up it m.'
T [u] l [u] ^{C} [k^{W}] i i	'I went up it f.'
m a a T [u] l [u] ^{C} k u u ʃ	'I didn't go up'/'I didn't go up it m.'

There are two problems: firstly, where does the [+R] feature stem from? And, secondly, why does the rule affect the right-most vowel in the case of verb forms with no vocalic melody, yet affect both stem vowels in the case of verb forms with a [+H] vocalic melody? I shall deal with the former problem first.

8.4.3. The representation of {first singular}:

In Kusmi, the underlying representation of the {first singular} subject pronoun is /ku/; in Hubaiʃi, either, the underlying representation of (first singular) is /k[+R]/ - that is to say, [+R] is an inherent (but floating) feature of the morpheme - or, the underlying representation is /ku/. In either case, [+R] must be a feature of the morpheme in order that [+R] spread can take place at all.

The most conclusive evidence for the proposal that [+R] is present in an underlying vowel is observed in the morph realised to the left of a negative suffix, <u>maa qatalk[uu]ʃ</u> 'I didn't kill', and the morph realised to the left of consonant-initial object pronouns, eg. <u>qatalk[uu]kum</u> 'I killed you m.pl.' . When, for example, the negative suffix, /ʃ/, is affixed to a final consonant sequence, the unsyllabified consonant triggers epenthesis of a rhyme-headed X slot. The NSV associates with this X slot and [a] would be the default realisation, viz:

*m a a q a t a l k [a] ʃ

i.e. that which is homophonous with the form for 'you m.s. didn't kill'

Were the representation of (first singular) /k[+R]/, where [+R] is simply a floating feature, it is anticipated that this feature would associate with the epenthetically-inserted rhyme-headed X slot. The realisation, in this case, would not be as given above, but rather:

*m a a q a t a l k [u] ʃ

However, this is again not the attested realisation, since the vowel has a durationally long realisation, [uu], viz:

m a a q a t a l k [u u] ʃ 'I didn't kill'

The durationally long vowel can be explained as an instance of pre-suffix lengthening (cf. 6.1.1.4.1.). Therefore, not only must [+R] be available in the morpheme, but also, [+R] must be a feature of an underlying vowel in order that pre-suffix vowel lengthening can occur in this instance. Vowels realised as a result of epenthesis are never subject to pre-suffix lengthening. The representation for the {first singular} subject pronoun is therefore posited as /ku/.

By positing /ku/ as the representation of the {first singular} subject pronoun it is possible to explain the variant realisations of this morpheme, and this I shall do now.

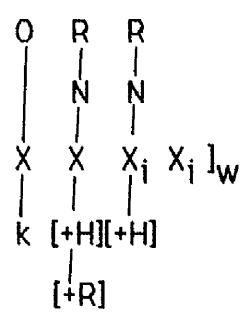
8.4.3.1. Vowel-initial suffixation:

To the left of an ultimate vowel-initial morpheme, two processes conspire against the occurrence of R_iR_{ii} and this contrasts with the single process available in Kusmi (complex consonant formation). These processes are complex consonant formation and feature spread.

8.4.3.1.1. Complex consonant formation:

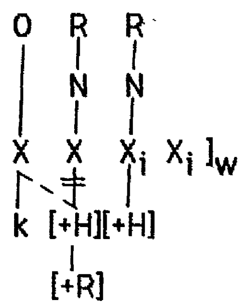
In case a vowel-final and a vowel-initial morpheme are concatenated, when R_i has the feature [+R], and the unsyllabified vowel has the feature [+H], the feature matrix is disassociated from R_i and reassociates with the slot of the contiguous roundable and labialisable consonant as an instance of complex consonant formation (cf. 1.7.2.2.1.). In contrast to other dialects of the area, the {second feminine singular} object pronoun is /ik/ in Hubaiʃi. The {third feminine singular} object pronoun is /i/. In case a {feminine singular} object pronoun is suffixed to the {first singular} subject pronoun, an anomaly of two contiguous rhymes is created, as in the example of /qatalku+ik/ 'I killed you f.s.', viz:

*

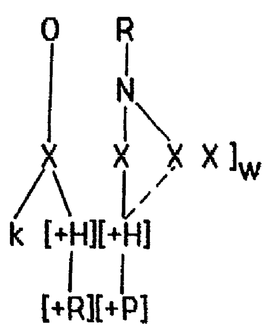


The vowel of the suffix is unsyllabified; this unsyllabified vowel triggers disassociation of the feature matrix of the adjacent vowel which subsequently reassociates with the adjacent roundable and labialisable consonant, viz:

Complex consonant formation:



The feature matrix of R_i spreads to associate with the empty rhyme-headed X slot (cf. 1.7.2.2.1.). The OCP subsequently brings about simplification to:



There is no loss of phonological information, simply a rearrangement of phonological features. The output is as below:

q a t a l [k^W] i i k 'I killed you f.s.' (cf. 1.7.2.2.1.)

8.4.3.1.2. Feature spread:

When a morpheme with a final marked vowel occurs to the left of an ultimate vowel-initial morpheme in which the vowel is underlyingly non-specified, complex consonant formation does not occur (in contrast to Kusmi), rather, the feature associated with the marked vowel spreads rightwards to associate with the NSV. Thus, when the [second masculine singular] object pronoun, /ak/, is suffixed to the [second feminine singular] subject pronoun, /ki/, in phonological word-final position, as in the instance of /qatalki+ak/ 'you f.s. killed you m.s.', [+H] associated with the vowel in the left-most morpheme spreads onto the NSV and the realisation, following the operation of redundancy rules, is:

q a t a l [k i i] k $]_W$ 'you f.s. killed you m.s.'

Consider the suffixation of the [second masculine singular] object pronoun to the [first singular] subject pronoun, as in the instance of /qatalku+ak/ 'I killed you m.s.':

Again, spread applies post-lexically when the suffixed morpheme is final in the phonological word, viz:

```
[+R]
 |
[+H]
 |\
 V  V C ]W
```

And the form for 'I killed you m.s.' is realised as below:

q a t a l [k u u k] $]_W$

8.4.3.2. Consonant-initial suffixation:

To the left of a consonant-initial suffix the vowel of the [first singular] subject pronoun is maintained in order to concur with the syllable template for the language. In negation, /ʃ/ is suffixed to the [first singular] subject pronoun as below:

/m a a + q a t a l + k u + ʃ/

Following pre-suffix vowel lengthening (cf. 6.1.1.4.1.), this form is realised as:

m a a q a t a l [u u] ʃ 'I didn't kill'

Similarly, when a consonant-initial object pronoun is suffixed to the {first singular} subject pronoun the vowel is maintained and pre-suffix vowel lengthening occurs when the object pronoun is final in the phonological word, eg:

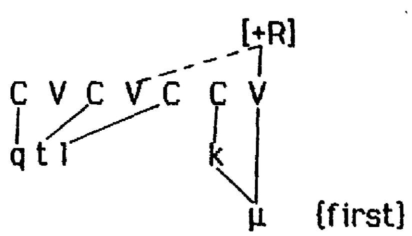
/q a t a l k u + k u m/ ---> q a t a l k [u u] k u m 'I killed you m.pl.'

In contrast to Kusmi, the vowel of the Hubaiʃi {first singular} subject pronoun does lengthen to the left of a phonological word-final suffix.

8.4.3.3. {First singular} in phonological word-final position:

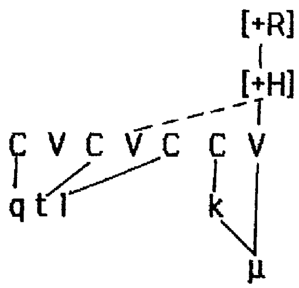
When the {first singular} subject pronoun is final in the phonological word, the final vowel is not realised; however, the final vowel of the verbal stem is realised as [u]. One analysis would be to propose that [+R] spread is triggered when the morpheme is final in the phonological word. This position would force us to conclude, however, that spread in this dialect is not parasitic on specification of the contextual feature, [+H], shared by trigger and targets, and this contrasts with spread in Kusmi. Once spread had targeted the right-most vowel of the verbal stem, [+H] would be filled in redundantly. Assignment of the feature [+G] by default rule to the left-most vowel of the verbal stem would block further spread. Consider the application of this analysis:

[+R] spread:



Assignment of [+H]:

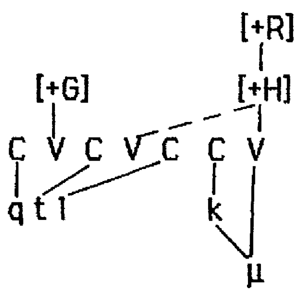
D.R. [ ] ---> [+H]/[___,+R]



(first)

Assignment of [+G]:

D.R. [ ] ---> [+G]/[___,-R/-P] (cf. 2.5.4.)

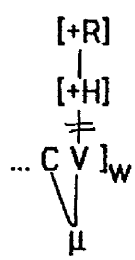


(first)

The assignment of [+G] to the left-most stem vowel would block further spread.

Vocalic feature disassociation would then apply when the form is final in the phonological word (cf. 2.1.1.1.1.1.), viz:

Feature disassociation:



(first)

Remaining redundancy rules apply and the final output would be:

q a t [u] l k $]_W$ 'I killed'

As in Kusmi, whether the NSV associates with the resulting empty rhyme-headed X slot, or whether the slot is subject to R_i disassociation (or bare nucleus deletion in utterance-final position) is dependent on the prosodic category of the following element (cf. 8.3.4.2.1.2.).

With this analysis the attested output has been generated; however, a statement that the right-most stem vowel is affected by [+R] spread if and only if the (first singular) subject pronoun is final in the phonological word does still appear to be rather ad hoc. There is no explanation as to why the process does not affect this vowel when the morpheme is <u>not</u> final in the phonological word. It would be necessary to conclude simply that the presence of a further morpheme in the phonological word blocks application of spread. The relationship between disassociation of vocalic features and [+R] spread targeting an NSV, both of which occur in phonological word-final position, is not illuminated.

8.4.3.3.1. An alternative analysis:

A far simpler analysis is to be found. When the (first singular) subject pronoun is final in the phonological word, [u] is not manifested in final position - and this is quite independent of whether the vocalic melody of the verb is underlyingly specified [+H] or there is no specified vocalic melody, viz:

T u l u ^{C} k $]_W$ 'I went up'

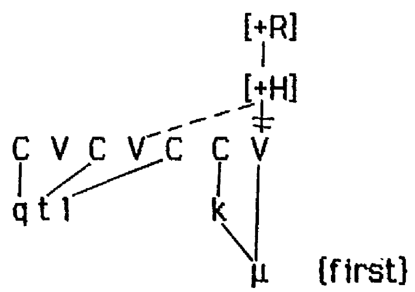
t u ^{C} u b k $]_W$ 'I tired'

q a t u l k $]_W$ 'I killed'

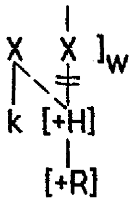
?abSurk$]_W$ 'I saw'

As mentioned in chapter two, when this morpheme occurs finally in the phonological word features are disassociated from the vowel (cf. 2.1.1.1.1.1.). Note that this is clearly a lexical rule since vocalic features of the (third masculine singular) object pronoun/possessive determiner are never disassociated in this position. In the case of (first singular), features disassociated from the final vowel reassociate leftwards with the right-most NSV of the verbal stem, as diagrammed below:

Feature disassociation and reassociation:



Only the right-most vocalic slot is targeted because this is not an instance of feature <u>spread</u>, rather of feature reassociation. The process is natural and operates in the same way as reassociation of the marked feature associated with the disassociated R_i with R_{ii} in a R_iR_{ii} sequence (cf. 2.4.2.1.2...). This analysis enables us to maintain the claim that lexical [+R] spread in the dialects is parasitic on the presence of a shared contextual feature, [+H]. The analysis also provides an explanation as to why the right-most vowel of the verbal stem in Kusmi is not realised as [u] when there is no vocalic melody underlyingly: as has been seen, in Kusmi, the phonological word-final disassociation of vocalic features is post-lexical and occurs whenever a short marked vowel occurs finally in the phonological word (cf. 8.3.4.1.1. and 8.3.4.2.1.2.). In this case, the disassociated feature matrix reassociates with the slot of the adjacent roundable or palatalisable consonant, and not with the stem vowel, viz:



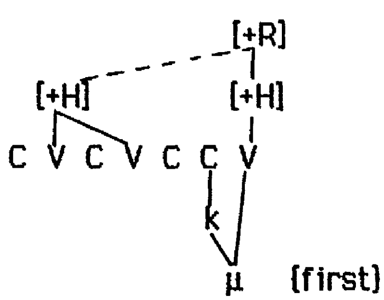
(and cf. 2.1.1.1.1.2.)

8.4.4. Sound triliteral verbs with [+H] vocalic melody:

In Hubaiʃi, as in Kusmi, when the vocalic melody of the verb is specified [+H], [+R] spread operates parasitically from a [+R] vocalic trigger in the {first singular} subject pronoun to [+H] target vowels in the adjacent morpheme. In contrast to Kusmi, [+R] spread applies from the {first singular} subject pronoun and from no other morpheme in which [+R] is a feature (i.e. {second plural}, the {third masculine singular} object pronoun). [+R] spread as it targets stem vowels of the verb is therefore said to apply parasitically from the {first singular} subject pronoun to [+H] vowels in an adjacent morpheme at an early stage in the derivation.

[+R] spread as it targets the [+H] stem vowels of the verb in the perfect aspect in Hubaiʃi is diagrammed below:

8.4.4.1. [+R] spread:



The [+R] vowel of the {first singular} subject pronoun is realised unless the morpheme is final in the phonological word in which case feature disassociation applies, as diagrammed above (8.4.3.3.1.).

8.4.5. The weak verbs:

I shall now examine [+R] spread as it affects the (first singular) inflectional form in the weak verbs. As for Kusmi, I shall begin by considering the hollow verb.

8.4.5.1. The hollow verb:

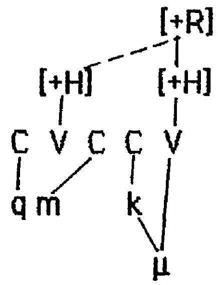
As observed in chapter seven, in the Hubaiʃi hollow verb, the short vowel of the inflected forms in the perfect aspect may be either specified [+H] or be non-specified. The basis on which vowel quality is determined in the hollow verb has been suggested above (cf. 7.1.3.): when the verb is (intransitive) (and a derived transitive verb exists for the root) the vocalic melody is [+H]; when the verb is (transitive), as in the general case, there is no specified vocalic melody, viz:

Derived		
N.A.	q [a] l k i	'you f.s. said'
k a w w a n	k [i] n k i	'you f.s. were/are'
n a w w a m	n [i] m k i	'you f.s. slept'
q a w w a m	q [i] m k u m	'you m.pl. got up'

As predicted, [+R] spreads parasitically onto the stem vowel of the hollow verb if and only if the subject pronoun is (first singular) and the vocalic melody is [+H] (realised as [i] in (first pl.) and in all (second) inflectional forms), viz:

q [u] m k	'I got up'	v.	q [i] m k	'you m.s. got up'
k [u] n k	'I was/am'	v.	k [i] n k	'you m.s. were'
n [u] m k	'I slept'	v.	n [i] m k	'you m.s. slept'

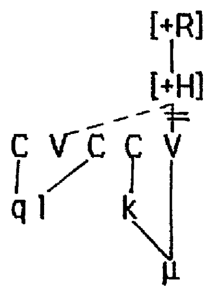
[+R] spread:



(first)

to give: q [u] m k $]_W$ 'I got up'

In case there is no specified vocalic melody, features are disassociated from the final vowel and reassociate with the verbal stem vowel (NSV), if and only if the (first singular) subject pronoun is final in the phonological word, viz:



(first)

to give: q [u] l k$]_W$ 'I said'

Again, whether the NSV associates with the empty rhyme-headed X slot following disassociation, or whether the slot is subject to deletion (by means of R_i disassociation) depends on the prosodic category of the following element.

In non-phonological word-final position, feature disassociation (and reassociation) does not occur, viz:

q [a] l k u u 'I said it m.'

q [a] l $[k^W]$ i i 'I said it f.'

m a a q [a] l k u u ʃ 'I didn't say'/'I didn't say it m.'

And this is precisely what the analysis predicts.

8.4.5.2. The third weak verb:

Attested data reveals that [+R] spread affects final weak verbs in the same way as it does other verb types. We observe:

r a Dh [o u] k	'I wanted'
b a k [o u] k	'I wept'
n a s [o u] k	'I forgot'
r a w [o u] k	'I am full (of food,drink)'

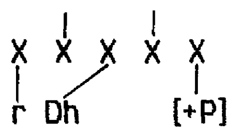
Again, [+R] spread affects derived third weak verbs in the same way as non-derived third weak verbs, viz:

(? a) ∫ t a r [o u] k	'I bought'
(? a) s t a f [o u] k	'I washed myself'

Consider the full paradigm of 'to want':

r a Dh o u k	'I wanted'
r a Dh e i k u m	'you m.pl. wanted'
r a Dh e i k i n	'you f.pl. wanted'
r a Dh e i n a a	'we wanted'
r a Dh e i k	'you m.s. wanted'
r a Dh e i k i	'you f.s. wanted'
r a Dh e i n	'they f. wanted'
r a Dh u u/m	'they m. wanted'
r a Dh i	'he wanted'
r a Dh a	'she wanted'

As in Kusmi, [+R] spread is restricted to the right-most stem vowel in this verb type. The morphological template for the third weak verb has some 'enrichment' - i.e. the final X slot is preassociated with [+P] - and the consonantal melody is biliteral (cf. 7.2.1.1.), viz:

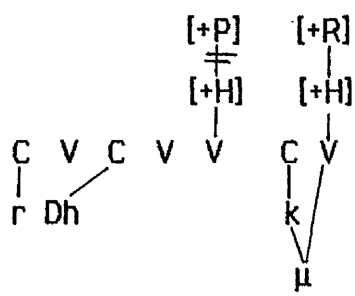


There is no specified vocalic melody. In the (first singular) inflectional form, the right-most element of the stem is the target of [+R] spread following the assignment of [+H] by default rule and the disassociation of [+P]. Consider the derivation of <u>raDhouk</u> 'I wanted':

8.4.5.2.1. Assignment of [+H]:

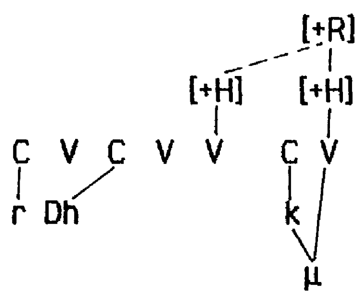
D.R. [ ] ---> [+H]/[___,+P]

[+P] disassociation:



(first)

[+R] spread:



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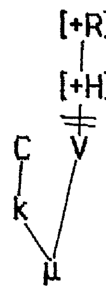
Features associated with the final vowel of the morpheme are disassociated when this morpheme is final in the phonological word, viz:

Feature disassociation:



(first)

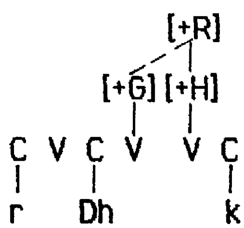
These vocalic features do not reassociate since [+R] has previously spread to the [+H] vocoid.

8.4.5.2.2. [+R] spread:

In the post-lexical component, [+G] is assigned to the NSVs redundantly, viz:

D.R. [ ] ---> [+G]

The labial node then spreads from the [+R] vocoid onto the zone of constriction node of the contiguous [+G] vowel at a low level in the derivation:



Since vowels specifed [+G,+R] are realised as [o] (cf. 2.3.1.), the final output following the operation of remaining redundancy rules is the attested:

r a Dh o u k 'I wanted'

In Kusmi and Hubaiʃi an exceptional rule exists as a sub-rule of lexical [+R] spread. Lexical [+R] spread in both dialects is parasitic on the presence of the contextual feature, [+H], shared by trigger and target segments. In both dialects, in the case of the sound triliteral verb type where the stem vowels are [+H], the rule applies from a vocalic trigger to (a) non-tauto-morphemic target(s). In Kusmi, the rule is operative in the environment of a consonant-initial subject pronoun: not only {first singular}, but also {second plural} and affixed {second masculine} and {third feminine singular} inflectional forms are sensitive to [+R] spread in this dialect. [+R] spread is operative, therefore, at level one - in the present model the inflectional level - and at level two - the level at which object suffixation applies - in Kusmi. In Hubaiʃi, on the other hand, the rule is strictly limited in application to {first singular}, and is, therefore, restricted to level one.

In spite of the surface differences, in both Kusmi and Hubaiʃi the underlying representation is /ku/ for the {first singular} subject pronoun in the perfect aspect of the verb. The fact that [+R] spread is strictly limited to {first singular} in Hubaiʃi would suggest that the rule operates earlier in the grammar for this dialect than for Kusmi. A glance at the hollow verb, however, suggests that this is not the case necessarily, since, when the stem vowel of the hollow verb in Kusmi is [+P,+H] (and results from feature reassociation following the deletion of an underlying [+P] vocoid), [+R] spread affects <u>only</u> {first singular}. Since 'assimilation' operates in a feature-filling way in the unmarked case, it is said that the presence of [+P] blocks spread of [+R] unless the inflectional form is {first singular}, in which case, [+P] is disassociated and the particular spread rule applies. It is observed that the specification [+P] of the final element in the third weak and doubled verbs likewise precludes [+R] spread in all but the {first singular} inflectional form.

It is suggested that in Kusmi [+R] spread affects the {first singular} inflectional form and then all other forms which meet the structural description. If [+R] spread were to affect all forms simultaneously, there would be no way by which to preclude such unattested forms as:

* s u r k u m for s [i] r k u m		'you m.pl. went'
* s u r k u n for s [i] r k u n		'you f.pl. went'

In these cases, the lexical feature of the vowel ([+P]) in the verbal stem takes precedence over the spread feature. In (first singular), the spread feature takes precedence over the lexical feature, which is disassociated, to produce:

? a n a s [u] r [k^W]   'I went'

In Hubaiʃi, the structural description for [+R] spread as it targets vowels in the perfect aspect of the verb requires the information (first singular). And so, in Hubaiʃi, [+R] spread as it affects the stem vowels of the perfect verb is restricted to this form and to level one. Since the domain of [+R] spread is restricted to the (first singular) inflectional form, [+R] spread does not target the stem vowels of the (second plural masculine) inflectional form, viz:

t [i] ^{C} [i] b k u m	'you m.pl. tired'
T [i] l [i] ^{C} k u m	'you m.pl. went up'

Conclusion

In this thesis I have considered aspects of the phonology and verb morphology in three mutually intelligible dialects of Yemeni Arabic in order to examine the relationship between these dialects. In the Introduction it was noted that approaches to dialectology to date have failed to provide psychologically plausible models for dialect variation. The diasystem of structural dialectology restricted the number of dialects that could be examined at any one time to two, and had the additional disadvantage of being as constructable for dialects of two totally unrelated languages as for closely related dialects of a single language. Generative dialectology aimed to establish single underlying representations for cognate forms in related dialects from which all dialect variation could be derived. While this model had the advantage of being able to handle more than two dialects at any one time, several criticisms could be levelled against it: these include the fact that underlying representations frequently either bore no relationship to realised forms in any one dialect - these forms would be derived by a sequence of improbable rules - or, the underlying representation from one dialect would be taken, for reasons of simplicity, thus giving the false impression that one dialect was directly derived from another.

In this study it has been shown that while related dialects of a language may share a single underlying representation for cognate forms - as in the case of the [first singular] perfective subject pronoun, /ku/, in Hubaiʃi and Kusmi - so the underlying representation may be different - as in the case of the [third feminine singular] perfective subject pronoun in these two dialects. Where underlying representations are identical, variation may manifest itself either in the lexical or in the post-lexical component. The difference in realisation of the [second feminine singular] subject/object pronoun (represented as /ki/) in Hubaiʃi and Kusmi is dependent on a post-lexical process of complex consonant formation occurring in Kusmi whenever a high vowel follows a palatalisable consonant in phonological word-final or in intervocalic position. In Hubaiʃi, complex consonant formation is restricted to intervocalic position and affects a roundable consonant followed by a round vowel, but not a palatalisable consonant followed by a high vowel. In Gabiini, coalescence appears to have once affected the {second feminine singular} subject/object pronoun in utterance-final position. It has since been generalised to all positions in which this morpheme occurs so that the representation for the {second feminine singular} subject/object pronoun in Gabiini today is not /ki/, but rather /ʃ/.

The difference in realisation of the {second plural} perfective inflectional forms in all three dialects is brought about by dialect-specific lexical [+R] spread. In Kusmi, this targets high verbal stem vowels and the trigger may be in the {second plural} or {first singular} subject pronouns, or in the {third masculine singular} object pronoun; in Hubaiʃi, [+R] spread targets high verbal stem vowels in the {first singular} inflectional form but in no other inflectional forms. In Gabiini, lexical [+R] spread simply does not occur.

Related dialects of a language may therefore differ in terms of underlying representation; they may share a single underlying representation for a cognate form yet differ in terms of the rules which apply in the lexical component of the grammar; they may also share a single underlying representation yet differ in terms of the rules which apply in the post-lexical component.

The fact that related dialects of a language have been shown to require different underlying representations for particular cognate forms has important implications for generative dialectology which require the development of a new overall model for dialect variation within the generative paradigm. From the data examined here it may appear that the closer two dialects are related the more variation is excluded from the post-lexical component and confined to the lexical component; however, such a claim naturally requires further research over a wide range of languages before it can be either corroborated or refuted.

APPENDIX

Utterance-Final Phenomena

As noted by Jastrow, utterance-final phenomena play a significant role in all Yemeni dialects:

> 'Pausalerscheinungen nehmen in allen jemenitischen Dialekten einen bedeutenden Platz ein und tragen sehr zum charakteristischen Klangbild des jemenitischen Arabisch bei.' (Jastrow 1984:294)

In this section, I wish to draw attention to the nasalisation of long high vowels in utterance-final position in Kusmi, Gabiini and Hubaiʃi and to the glottalisation of utterance-final consonants. The purpose of this section is not to establish the precise processes involved in these low level phonological 'infections' but simply to show how these two processes may be related, how they differ and how, in particular, glottalisation differs from what may be superficially considered part of the same phenomenon - namely laryngeal rhyme branching in utterance-final position (cf. 3.1.1.2.). I shall discuss nasal infection (cf. Archangeli 1984a:99 for use of the term 'infection' in this sense) of utterance-final high vowels in Kusmi and Gabiini and of utterance-final palatal vowels in Hubaiʃi before continuing to examine glottal infection of utterance-final consonants in all three dialects. Note that, while data from Hubaiʃi will be taken to examine this latter phenomenon it can be assumed that the same type of constraints are operative in Gabiini and Kusmi. It will be seen that these phenomena are not peculiar to the dialects in question, rather they are features of dialects spoken in the vast central area of Yemen. Glottal infection of consonants also features in some Egyptian dialects such as Bani Sweef

(Woidich, in Jastrow and Fischer 1980:208), and in dialects of South Arabian languages (Hayward, p.c.). This phenomena is not language specific, therefore, rather it is an areal feature which transcends the boundaries of adjacent Semitic languages. This observation adds further weight to the tentative suggestion that the closer two dialects are related the more variation will be confined to the lexical component and the less to the post-lexical component. We have seen that Kusmi and Gabiini have identical phoneme inventories (cf. chapters two and three) and that all three dialects share the vocalic phoneme inventory, the NSV (chapter two), the NSC (chapter three), and the lexical NSS (chapter five). Post-lexical syllable structure conditions are identical in the three dialects examined. Post-lexical variation was observed, not in the conditions, but rather in the realisation of the conspiracy invoked to maintain structure. In the lexical component, on the other hand, marked dialect variation was observed, not between Hubaiʃi and the Raimi dialects only, but also between the two Raimi dialects. This variation was noted particularly in the ablaut process which affects the stem vowels of the perfect verb in Kusmi but is quite absent in Gabiini (cf. chapter eight). With utterance-final phenomena, what is being examined are processes which occur at a very low level in the derivation.

A.1. Nasal infection of long high vowels:

The nasalisation of final long high vowels is a process which occurs in dialects spoken throughout the western mountain range, into the Tihaama and north into the dialects spoken around Sa^{c}da. Behnstedt observes the phenomena in dialects spoken around Sa^{c}da, and says:

> 'Diese Erscheinung reicht vom äußersten Süden des Landes über die Tihaamah hinein in unsere Gegend.' (Behnstedt 1987:19)

Diem notes that nasal infection of final /u/ and /i/ is operative in al-Hadijja and al-Mahall (both within the naaHijja of Raima) (Diem 1973:78). Jastrow observes nasal infection of /i/ in dialect of Gibla (Jastrow 1980:111). In his study on Yemeni dialects, Rossi notices nasalisation of final /i/ in the Tihaama and in Ibb, viz:

? a n ĩ i]φ	'I f.s.'
l ĩ i]φ	'to me' (cf. Rossi 1938:470)

Rabin also noted utterance-final nasalisation in Yemeni speech and states:

> 'I have heard gramophone recordings of Yemenite Koran recitations in which the nasal timbre in pause is noticeable.' (Rabin 1951:37)

A.1.1. Nasal infection in Gabiini and Kusmi:

In Gabiini, all final long high vowels are subject to diphthongisation and nasal infection in utterance-final position - (cf. 2.2.2.1.1.). The following items are attested:

/b a i t + i i/ --> b e e t i j]φ --> b e e t [ĩ j]]φ 'my house'
/s a a f a r + u u/ --> s a a f a r u w]φ--> s a a f a r [ũ w]]φ 'they m. travelled'

In Kusmi, this phenomena appears to be restricted to non-round high vowels. However, since the {masculine plural} marker is marked by a final /m/ (cf. Fischer and Jastrow 1980:111 for Gibla), it appears, on evidence that /uu/ is nasalised when utterance-final in dialects spoken in areas adjacent to the Kusmi markaz, that it is only the presence of final /m/ which precludes utterance-final nasalisation:

/b a i t + i i/ --> b e e t i j $]_{\varphi}$ --> b e e t [ĩ j̃] $]_{\varphi}$ 'my house'

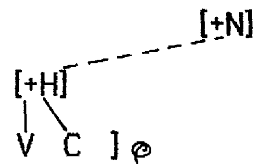
/s a a f a r + u m/ --> s a a f a r u m $]_{\varphi}$ 'they m. travelled'

/k a t a b + u m/ --> k a t a b u m $]_{\varphi}$ 'they m. write'

/k a t a b +ķu m/ --> k a t a b ķ u m $]_{\varphi}$ 'you m.pl. write'

Since no final /uu/ occurs in Kusmi, the process of nasal infection is formalised as below after identity diphthongisation has taken place:

A.1.1.1. Nasal infection:



An epenthesised [+N] feature docks onto [+H] as indication of utterance-finality whether or not the diphthong concerned is also [+R]. It must be noted that the diphthong is not evenly nasalised throughout its length, rather the [N] feature interpolates from right-to-left such that nasalisation decreases the further from the utterance-final boundary.

A.1.2. Nasal infection in Hubaiʃi:

In Hubaiʃi, utterance-final nasal infection occurs only in case the affected sequence is high but not round. In order to preclude the nasalisation of [+R] vocoid sequences the feature on which nasalisation is dependent is not [+H], rather it is [+P]. We observe:

/ʃ i i/ --> ʃ i j $]_{\varphi}$ -> ʃ [ĩ j̃] $]_{\varphi}$ 'thing'

/b a i t + i i/ --> b e i t i j $]_{\varphi}$ -> b e i t [ĩ j̃] $]_{\varphi}$ 'my house'

/m a d r a s t + i i/ -> m a d r a s t i j $]_{\varphi}$ -> m a d r a s t [ĩ j̃] $]_{\varphi}$ 'my school'

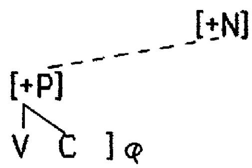
<u>but</u>

/g i z i^{C} + u u/ --> g i z i^{C} [u w]] φ 'they m. went'

/r a S a d + u u/ --> r a S a d [u w]] φ 'they m. wrote' [1].

Nasal infection must have access to the feature [+P] and is formalised as below:

A.1.2.1. Nasal infection:



Again, nasal infection is unambiguously a feature of utterance-finality.

A.2. Glottal infection:

In utterance-final position, glottal infection affects the final consonant of an utterance unless the consonant is a fricative, or a laryngeal fricative falls within the scope of the affected syllable. It was noted by Jastrow for San^{C}aani that final /h/ is never subject to glottal infection. Unfortunately, the only instances of final /h/ which he provides are those of the pronominal suffix. In San^{C}aani, (as in Gabiini and Kusmi) /h/ is maintained as a marker of the (third) person object pronoun, viz:

q a t a l a h] φ 'he killed him' (Jastrow 1984:295)

In this section I shall consider the relationship between nasal and glottal infection. I shall then consider the way in which other researchers have treated utterance-final glottalisation in dialects of Yemeni Arabic. I shall

1. In many ways a lowered velum is the 'rest position' of that organ; utterance-finality is where it would be expected such a state to obtain. Moreover, the occurrence of nasalisation on 'i' is much more likely than on 'u', since the latter requires an active velar stance.

examine glottal infection of different consonants and different syllable types as shown by women Hubaiʃi speakers, and shall note those instances where glottal infection does not take place. Finally, I shall detail the phonetic changes which occur for those consonants regularly subject to glottal infection.

A.2.1. The relationship between nasal and glottal infection:

Initially, it appears that nasal infection and glottal infection have identical functions; however, there are several important distinctions which must be drawn:

a) Firstly, the scope of glottal infection is far larger than the scope of nasal infection in all three dialects: far more segments may be glottalised in utterance-final position than the segments that may be nasalised. Nasal infection is restricted to one type of structure $-\underset{[+H]}{\overset{|}{X}\ X}\,]_{\varphi}$, in Gabiini/Kusmi

and $-\underset{[+P]}{\overset{|}{X}\ X}\,]_{\varphi}$, in Hubaiʃi

while glottal infection, on the other hand, may affect several different structures as will be noted below.

b) Secondly, while final nasalisation of long [+H] or [+P] vocoids occurs unconditionally in the dialects, final consonant glottalisation is dependent on the quality of the consonant affected and the quality of consonants within the affected syllable.

c) ~~Thirdly,~~ stress plays a significant role in glottal infection. Since long final vowels in Yemeni dialects never receive word stress (and cf.

Behnstedt 1987:17) nasal infection of final $-\underset{[+H/+P]}{X\ X}\,]_{\varphi}$

cannot be said to be stress dependent. While nasal infection is indicative of utterance-finality, glottal infection is indicative of a complex of factors including consonant quality and word stress.

Utterance-final glottal infection is certainly relatively complex in the dialects. Researchers have, in general, had some idea that glottal infection is sensitive to stress but there is no agreement as to the nature of the sensitivity. Rossi believed that glottal infection affected the final consonant of a VVC rhyme:

> 'Un ? nonetimologico appare (sull'altipiona) come se detto, dopo a lunga accetata es. maa?l 'campo'.' (Rossi 1937:235)

Diem observed that glottal infection affected final C in a VVC or VGC rhyme in Yaʃii^{C} (Diem 1973).

Jastrow notes in 1980 that glottal infection affects a final consonant in the speech of women from Gibla whether or not that consonant is preceded by a long vowel:

> 'Endet eine Silbe auf . . vK - wobei es gleichgultig ist, ob es sich um einen kurzen od. langen Vokal handelt - so wird der Glottalverschluß meist vor dem K realisiert.' (Fischer and Jastrow 1980:110)

For San^{C}aani speakers (men and women), Jastrow demonstrates that C does not have to be preceded by a long vowel or diphthong to be subject to utterance-final glottal infection. He supplies the following examples:

/r a a g i d/ --> r a a g i ? $\underset{\circ}{d}$ $]_{\varphi}$ 'sleeping m.s.'

beside:

/r a a g i d i i n/	-->	r a a g i d i i ? n̥]$_\varphi$ 'sleeping m.pl.'
/S a a m/	-->	S a a ? m̥] or S a ? m̥]$_\varphi$ 'fasting'

He appears to assume that glottal infection occurs independently of other factors, however, which is counter to our observations. He claims:

> 'Endet ein Wort auf K, so erscheint der glottale Verschlußlaut in der Regel nach dem Vokal der betreffenden Silbe.' (Jastrow 1984:295)

Here it is claimed that glottal infection is sensitive to a complex of factors. This will be demonstrated in what follows.

A.2.2. Instances of glottal infection in Hubaiʃi:

The data supplied below is taken from women speakers of Hubaiʃi. I shall provide illustrations of glottal infection as it affects different types of syllables and then continue to provide instances where glottal infection does not take place:

A.2.2.1.

1. Glottal infection of C_i in final stressed CVVC_i]$_\varphi$

/s a w w a a q/	s a w 'w a a[?]]$_\varphi$	'driver'
/T a r i i q/	T a 'r i i [?]]$_\varphi$	'route'
/k a l a a m/	k a 'l a a [? m̥]]/ k a 'l a [? m̥]]$_\varphi$	'talk/speech'
/b i l a a d/	b i 'l a a [? d̥]]$_\varphi$	'village'
/b a ^{c} i i d/	b a '^{c} i i [? d̥]]$_\varphi$	'far'
/q a a t/	q a [? t]] / q a a [? t]]$_\varphi$	'qat'
/z a m a a n/	z a m a a [? m̥]]$_\varphi$ [1.]	'time'

1. This involves assimilation of /n/ in the environment of /m/.

Where the vowel is not reduced in these instances, the final consonant is frequently reduced to inaudibility - in particular, if the consonant concerned is a sonorant or /q/.

2. Glottal infection of C_i in $CVCVC_i$]:φ

/m a l i k/	'm a l i [k']]φ	'king'

3. Glottal infection of C_i in final stressed $CVCC_i$]:φ

/? a b S a r k/	? a b 'S a r [k']]φ	'you m.s. saw'
/l a i l/	'l e i [? l̥]] φ	'night'
/s a m n/	's a [m ?]]φ	'fat, oil'
/^{c} a m m/	'^{c} a [m ?]]φ	'uncle (paternal)'
/x u b z/	'x u b [(z̥)?]] φ	'bread'

4. Glottal infection of C_i in $CVCCVC_i$]:φ

/n i ^{c} m u r/	'n i ^{c} m u [? r̥]] φ	'we build
/b a i n i k/	'b e i n i [k']] φ	approx. 'with you f.s.'
/b a i n a k/	'b e i n a [k']]φ	approx. 'with you m.s.'

5. Glottal infection of C_i in $CVVCVC_i$]:

/x a a l i d/	'x a a l i [? d̥]] φ	'Khalid', personal name
/k a a t i b/	'k a a t i [? b̥]] φ	'clerk, writer'

6. Glottal infection of C_i in $CVCCVCVC_i$]:

This only affects final /k/:

/s a j j a b i k/	's a j j a b i [k']]φ	'God forsake you f.s.'
/s a j j a b a k/	's a j j a b a [k']]φ	'God forsake you m.s.'

A.2.2.2.

1. Non-glottal infection of C_i in $CVCCVC_i]$:φ

/f i ^{c} l a n/	'f i ^{c} l a n]φ	'really, in fact' (adverb)

2. Non-glottal infection of C_i in $CVCVCVC_i]$:φ

/? a b a d a n/	'? a b a d a n]φ	'never' (adverb)

3. Non-glottal infection of C_i in $CVCVC_i]$:φ

/j a m a n/	'j a m a n] φ	'Yemen'
/l a H m/	'l a H a m] φ	'meat'
/b a H r/	'b a H a r] φ	'sea'
/s a ħ m/	's a ħ a m]φ	'share'
/ʃ a h r/	'ʃ a h a r] φ	'month'

I have never encountered instances of glottal infection where the morpheme is the (third masculine singular) inflectional form of the verb. This may well be due both to stress and to the fact that the non-suffixed form of the verb in this person rarely occurs in utterance-final position.

4. Non-glottal infection of C_i in $CVC_iC_i]$: φ

/H a d d/	'H a [d]]φ	'extent'
/H u b b/	'H u [b]]φ	'love'

A.2.3. The role of word stress:

From this data it can be seen that glottalisation of C does not affect the final C of a light syllable unless the stress is penultimate as in A.2.2.1., 2., 4. and 5., or the consonant concerned is /k/ as in A.6. Glottal infection never affects the final /n/ of adverbial forms as seen in A.2.2.2..1. and 2.

above. Glottalisation does affect the final C of stressed syllables of the pattern: CVVC and CVGC, but not stressed syllables of the pattern CVC_iC_i unless the C is liquid 'l' as in /k u l l/ --> k u [? l̥]] .φ

A.2.4: The quality of consonants:

Glottal infection never affects the final C of a syllable if that syllable contains a laryngeal fricative whether or not that fricative is final in the form.

1. CVCVC

/ʃ i m i h/	'ʃ i m i h] φ	'he saw'
/w a h a m/	'w a h a m] φ	'pregnancy'

2. CVCVCC

/m u h i m m/	m u 'h i [m]] φ	'important'

3. CVCC

/? a l f/	'? a l f] φ	'a thousand'
/x a l f/	'x a l f] φ	'behind'

And in A.2.2.2. 3, above we observe that the final consonant is not glottalised in case it is preceded by /h/ or /H/ when an epenthetic vowel is inserted in utterance-final position. Glottal infection never affects the gutturals /h/, /H/, /x/, but the voiced pharyngeal glide /^{C}/ may be pre-aspirated and devoiced as in:

/T u l u u ^{C}/	Ṭ u l u u [^{h} C̥]] φ	'rising, going up'

As the final element in a CVVC syllable, /f/ may be pre-aspirated as below:

/Dh a ^{c} i i f/	Dh a ^{c} i i [^{h}f]]$_{\varphi}$	'weak'
/q a a f/	q a a [^{h}f]]$_{\varphi}$	'qāf' (the radical)[1].

A.2.5. Phonetic changes:

Of those consonants regularly subject to glottal infection, the following phonetic changes occur:

A.2.5.1. Obstruents:

/k/ is realised as an ejective, viz:

m a l i [k']]$_{\varphi}$	'king'	t u r [k']]$_{\varphi}$	'Turk'
? a b S u r [k']]$_{\varphi}$	'I saw'		

/t/ is generally realised with a preceding glottal stop (but may also be realised as an ejective):

q a a [? t]] / q a a [t']]$_{\varphi}$ 'qāt' (leaf chewed as a stimulant)

/q/ is realised either with a preceding glottal stop or is elided:

T a r i i [?]]$_{\varphi}$	'route'	(from /T a r i i q/)
S u n d u [? q]]$_{\varphi}$	'box'	(from /S u n d u u q/)

Voiced obstruents are realised with a preceding glottal stop and are subsequently devoiced in all cases:

b a ^{c} i i [? d̥]]$_{\varphi}$ 'far'

Or they are reduced to the extent of inaudibility:

b a ^{c} i i [?]]$_{\varphi}$ 'far'

1. It has been suggested that 'pre-aspiration', in this case, could be regarded as devoicing of the end portion of the vowel before a voiceless fricative (Hayward p.c.).

gh a r i i [?]] φ	'strange'	(from /gh a r i i b/)
^{c} e i [?]] φ	'shame'	(from /^{c} a i b/)

A.2.5.2. Sonorants:

Sonorants are invariably devoiced and are frequently elided completely, particularly as the final consonant of a CVVC syllable:

k a r i i [? (m̥)]] φ	'kind, generous'
k a l a a [? (m̥)]] φ	'speech'
q a a [? (l̥)]] φ	'he said'
d a a [? (r̥)]] φ	'house'

A.2.5.3. Sibilants:

The unvoiced sibilant 's' is realised with a preceding glottal stop. A glottal stop is either realised after the voiced sibilant /z/, or /z/ is subject to elision, in particular, when the final consonant of a CVCC syllable (and cf. Fischer and Jastrow 1980:110 for Gibla). The voiced sibilant is invariably devoiced:

f u l u u [? s]] φ	'money' (adopted from Egyptian dialect)
x u b [(z̥) ?]] φ	'bread'
n u x b u [z̥ ?]] φ	'we bake'

The sibilant /ʃ/ is subject to pre-aspiration if preceded by a vowel; if preceded by a consonant it is generally not affected by glottal infection at all:

m a a b u u [(^{h}) ʃ]] φ	'there is not'
m a a k a t a b ʃ] φ	'he did not write'

That /k/ is the only consonant which is regularly realised as an ejective is perhaps not surprising when one realises that of the ejective consonants in South Arabian languages the ejective quality of /k/ is far more noticable than the ejective quality of other consonants. (cf. Carnochan in discussion following a paper delivered by T.M. Johnstone 'Contrastive Articulations in the Modern South Arabian Languages' published in Hamito-Semitica (J. and Th. Bynon eds. 1975:158).

A.2.6. How to represent glottal infection:

As yet, I have not been able to establish an adequate representation for glottal infection; however, it does appear that an epenthesised [+G] docks onto the final consonant in utterance-final position after the assignment of word stress. Whether a glottal stop is realised before the consonant or the consonant is realised as an ejective depends on the nature of the consonant infected:

A.2.6.1.

$$\begin{array}{l} \qquad\qquad\ [+G] \\ X\ X\ X\ X\ X\ ]\ \varphi \end{array}$$

While the above observations have been made for Hubaiʃi women's speech, it can be inferred that similar constraints are operative in Gabiini and Kusmi. It is important that more work is conducted in the field of utterance-final phenomena in Yemeni Arabic, however, it is clear that, while the glottal infection of consonants occurs only in utterance-final position, the process is dependent also on a variety of other factors - the quality of the consonant infected - /k/ is always infected, laryngeal fricatives could never be infected, other fricatives are more likely to be subject to aspiration than to glottalisation; also, the quality of other consonants within the affected syllable - laryngeal fricatives within the syllable preclude glottal infection; and word stress - only words with penultimate or ultimate stress are subject to glottal infection of the final consonant unless the affected consonant is /k/.

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